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Some Points in the Natural History and Therapeutics of British Red-water.*

By F. T. Harvey, F.R.C.V.S., St. Columb.

Having been a bad attendant in recent years at the meetings of the Western Counties' Association, I thought some compensation might be offered in the form of a paper. A discussion on red-water, or black-water, as it is often termed in the West of England, may seem out of place and unnecessary in these days, but there is yet much to learn concerning many of our common diseases, of which this is one. I do not propose to deal with it in detail, but rather to discuss certain features, or aspects, which are not dealt with in the literature, and incidentally, the bearing of some of the newer physiology and pathology on its management and treatment. We are dealing, of course, with a piroplasmosis and in the West of England the *P. divergens* is the common causative parasite. This three host tick-borne disease is perhaps commoner now than ever before, due probably to several factors; more land is down to so-called permanent pasture, much of which is badly managed owing to the high cost of labour, etc., and there is a greater traffic in cattle. Thus on one farm, formerly mostly arable land, where to my knowledge no case of red-water occurred for twenty years, there was a change of tenants, and the land laid down to grass and wholly grazed by cattle. Many tick-infested animals were brought in and since that time there have been hundreds of cases of the disease.

Epizootiology, Immunity, and the Accidental Factor in the Causation of Clinical Red-water.

The disease occupies a curious position. Actually it is an accidental affair, in many instances; that is to say, the great majority of infected animals show no symptoms and therefore do not suffer from red-water. Infection may have taken place, and the state of infection continue during the natural life of the animal, and the latter may be capable of transmitting it to other animals by means of ticks, or tissue inoculations, and yet never suffer from red-water. Such animals are in a way carriers, but they are not true carriers in the sense in which the term is generally used. With the latter the infecting organism is extra-territorial, so to speak, residing on mucous membranes, or in cavities lined by mucous membranes, as in diphtheria, typhoid, or certain cerebro-spinal diseases. Here the carrier is not actually infected—it merely harbours. Red-water infection more nearly resembles syphilis, and malaria, in the possible life-long infection, but differs from these diseases in that infection does not tend to induce structural changes in internal organs, nor, as far as is known, does infection predispose to other diseases. The animal becomes pre-disposed to red-water only, as a result of infection, just as infection with Bang's bacillus predisposes to abortion, but produces no other change. There is a minimum period of incubation before clinical red-water may be manifest, but there is no maximum period. The former is one of days, the latter of years. This is a matter of legal importance, several actions at law having arisen. Strictly speaking, animals carrying piroplasms in their blood or elsewhere, are not sound, but proof of pre-sale infection, though probable, would be very difficult in late manifestations of symptoms. Professor Craig(1) puts the minimum time under natural conditions as fourteen days. Animals showing symptoms in less than twelve days might certainly be regarded as unsound at the time of sale.

Immunity in red-water, again, is peculiar in that it is largely an immunity from symptoms or evident hæmolysis but not from infection. It is probable, however, that many animals are capable of killing the parasite outright whenever it gains entrance to their tissues, and thus enjoy for years a true immunity, but this power may be ultimately lost. On infected tick-infested farms practically all the bovines must be frequently re-infected and yet but few may show symptoms, unless cattle are brought in from outside, especially from clean areas, or some untoward event occurs in relation to some particular animal, or the herd generally. The etiology of the red-water attack is thus largely promiscuous, or accidental, and brings red-water into line with black-water fever in man, where malaria, a large dose of quinine, or exposure to cold, following residence in a tropical country, may determine the attack, which is often very severe. There is no doubt that the first infection, all things being equal, is the one most likely to be followed by symptoms, in adults at any rate; we must therefore suppose that the animal does learn to exercise some sort of control over the organisms, or that the hæmolyzing organs become more efficient in dealing with any hæmolysis which may occur in subsequent infections. Chance or accident are thus ever present, as to whether the red-water syndrome will or will not follow infection and in treating the condition the same factors are existent and may modify or aggravate the attack. Of no treatment in this country at present can it be said that it directly affects, in the least, the parasite itself, if we except the possible specific effect of tartarised antimony, and yet the treatment of the attack, as a rule, is fairly successful, again in the absence of accident.

In this paper I use the terms "red-water" and "black-water" as inter-changeable and meaning the same disease, the urine being in some cases more or less red in colour and in others black as ink. The character of the water is pathognomonic in that most laymen can diagnose the disease and nearly all have cures, more or less certain, according to the temperament of the individual, and all patent medicines are specific for it. Cures comprise port-wine, salts, salt, iron rust, live frogs and salted

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herrings, to mention only a few. No doubt with any or all of these things many animals recover, but the apparent ease with which cure is so frequently obtained is indirectly responsible for a good deal of mortality in the more severe cases. I think if an accurate record could be kept of the mortality associated with red-water, over a given area, it would be found to be much higher than we are apt to suppose. I quite agree that the mortality would be low if cases were properly managed from the beginning. Wooldridge(2) gives the average mortality as 5 per cent., but if we include casualties it is very much higher. An affected animal, until the water has cleared, and even for a few days after, is on the verge of a catastrophe and it is this aspect of the disease which makes its management so intriguing and the final outcome so uncertain, and it forms a veritable pit-fall for the young practitioner. No one reading a text-book description of the disease would realise for a moment the many, as the late Wallis Hoare used to term them, "Catastrophes of Medicine," which may be met with in red-water. There are few more worrying cases than to be called in to treat an affected animal which has gone wrong, so to speak, or one in the last stages of the disease, or one which has perhaps been heavily dosed with purgatives which have not acted. The veterinary surgeon is too often the refuge of the man whose home doctoring has failed and the professional man frequently gets the credit for the death of the patient. Many diseases may kill of themselves but red-water renders the animal easily killable by quite commonplace events. Infected animals may show no symptoms, but over-driving, standing in pools during hot weather, a sudden change of temperature—particularly cold blasts, or storms—œstrum (this latter disturbs both males and females) and many other events may determine clinical red-water. Any or all of these may be regarded as *Precipitating Factors* and without them the hæmoglobinuria might not have occurred.

Diagnostics and Prognostics.

Sometimes the urine has not been on view and no ready-made diagnosis is at hand. I do not suppose I am the only practitioner who has missed a case on occasion. If in an early stage, the diarrhœa, so often present, is almost diagnostic. It is of the projectile or pipe-stem character; the fæces are bile-stained, ejected with force and straining action. The condition of the sphincter or anal muscle is interesting. It is in a state of increased tonus or spasm and opposes the animal's efforts to empty the rectum. It is perhaps due to a reflex determined by the irritating nature of the fæcal matter within the rectum or bowel. This anal algia or increase of tonus is of some importance as an index of the progress of the case. I have not infrequently noticed that the urine has appeared to clear, but that the marked sphincter spasm has continued and in such cases it (the urine) has again become dark. Later the fæcal matter thickens and is ejected in a spiral or corkscrew manner and finally held up altogether. The bowel goes to sleep. The clue thus obtained will suggest an examination of the urine, but none may be obtainable, especially if the condition is of some standing. The membranes will then be pallid and the animal will prefer the ground. The heart's action may be heard some distance away, but frequently not so. Place the ear over the quarter above and behind the hip joint. If you can count the heart-beats you have in all probability a case of red-water, or an animal which has had a recent hæmorrhage. As with the anal tonus the sign is of some value as an index of the stage of the disease and indirectly of the progress of the case. It is not usually very evident before the third day of the attack and I regard its absence in a case of red-water as of good omen, but while it continues, the animal must be handled with great caution: any energetic measures as regards purgatives, heavy draughts of drinking water, or water given per tube in quantity, movement, or excitement, may be disastrous. It is well known that cattle often urinate on entering a pool. I once knew of this being done in a case of red-water. The beast collapsed and was drowned.

The Nervous System. There is no doubt that the autonomic or sympathetic and para-sympathetic systems are more or less in difficulties in red-water, but the brain also may suffer. I have seen otherwise quiet animals charge anyone who appears on the scene and here again a mistake in diagnosis may be made. I regard brain disturbance as of very bad omen, as also, the coarse tremors of the shoulders or thighs as sometimes seen. The brain disturbance is probably due to blood deterioration and low blood pressure.

The Heart and Blood Pressure. I have casually alluded to the brain, but the heart is perhaps still more important. Several factors may determine serious changes in the heart, such as death of corpuscles, toxic material and foreign proteins in the blood, and the myocardium must lose, in common with the tissues generally, some of its water. The organ is thus working under a penalty even quite early in the attack. Is it any wonder that we get shocks of the kind I have mentioned above at all stages of the disease? We need to anticipate the possibility of failure of the organ before the stage is reached when its thumps may be heard ten or more yards away, and when it is contracting on almost nothing, for the blood will by then to a great extent have faded away. There seems to be a tendency to a fall in blood pressure in red-water from the start, for the factors which produce it are present—diminished blood volume, impaired heart and loss of arterial tone, as shown by the soft compressible arteries and sometimes the markedly dicrotic pulse, the recumbent position assumed by the animal, and perhaps the suppression of urine sometimes noted towards the end. The effect on the brain has been already noted. A low blood pressure is said to result in acidosis in varying degrees of severity.

The Lungs. In theory the lungs should escape serious damage in red-water for they will have less work to do with the fall in blood volume; but this is not the case. On the whole, however, the lungs appear to weather the storm better than the heart, provided nothing finds its way down the trachea. On one farm three beautiful animals (two cows and a steer) died in the course of eighteen months from what appeared to be pneumonia, but they were really cases of bad management in drenching.

There is one form of disturbed breathing which I have not seen described; it consists in frequent deep respirations unaccompanied by grunting and physical signs of lung damage. I have seen the breathing quickly improve on giving the animal a pound or two of syrup or sugar.

It seems a kind of air-hunger and is perhaps an expression of an impending acidosis.

The Kidneys and Urine. Although the change in the urine is so obvious in red-water, the kidneys really play a secondary part in the red-water cycle compared with that of the liver and those organs associated with the portal system generally. It appears that hæmoglobin does not pass through the kidney until it has reached a certain concentration or level in the blood and this level may vary in different individuals, and when hæmoglobin does appear in the urine it is an indication that the liver and the reticulo-endothelial system are in difficulties and calling for help. It probably explains why purgatives, which relieve the liver and portal system, but do not act on the kidneys, frequently improve the animal in a somewhat dramatic fashion. There is a very great rise in the amount of urine passed in red-water, in some cases enormously so, the urine coming down like flood-water. I have seen such cases collapse quite early. One may make an interesting comparison as regards renal function between black-water of bovines and black-water fever in man. In the latter the urine is diminished and may even be suppressed owing to the deposit of hæmatin in the tubules, but in cattle the kidneys seem to suffer little damage as a rule. It seems to be a question of the reaction of the urine, the alkaline urine of herbivora favouring the passage of hæmatin while acid urines tend to precipitate it. I think precipitation of hæmatin in the tubules of the kidney with suppression may take place in black-water (cattle) when the urine is very thick, or in the late stages of the attack, particularly in association with a fall in blood pressure. In speaking of the urine in red-water only hæmoglobin is mentioned, as a rule, but bile pigment, urobilin, water, salt and other bases with nitrogenous waste appear in greatly increased quantities. A sample of urine should be taken twice daily, and if it is not clearing in forty-eight hours we should anticipate storms and re-consider the treatment. The appearance of the froth seen on shaking the urine may be some guide to the progress of the case. It should become paler and quickly resolve. Some urines become much darker on exposure to the air; this is said to be due to the presence of urobilin, which has probably been absorbed from the bowel, but it may be associated both with the death of blood cells and liver dysfunction. Thus all the facts seem to point to the conclusion that it is the liver system rather than the renal which is the more important in British red-water and in most forms of hæmolysis.

Drenching Accidents. Red-water is a disease which furnishes more of what appear to be drenching accidents than any with which I am acquainted and, curiously enough, it is not infrequently the first dose which does the mischief. An animal in quite an early stage of an attack is brought up and given perhaps a pound of salts, or some other mixture, and in an hour or two it may be dead. On one occasion three big bullocks, out on agistment, were seen to be passing dark urine, but otherwise appeared normal. They were taken in by the farmer and each given mag. sulph: 1½lbs. One died shortly after dosing, another on the second day, apparently from pneumonia, the third recovered without ill effects. A law suit followed. The owner pleaded that the cattle should have been at once slaughtered for food and not treated, this line being adopted on the advice of an up-country city practitioner. Had he pleaded negligence by the farmer in that he did not at once obtain professional assistance, he might have won his case.

On a farm last year two such cases occurred. A young cow was given sodium chloride, soda sulph. and treacle. In a short time she was grunting, became cold and tympanitic and died in about sixteen hours. The second, a fat steer, showed similar symptoms and was at once slaughtered. The meat appeared to have lost much of its sap, had little colour and was tough. February, 1899—A two-years-old steer with red-water was given mag. sulph. and soda chlor. of each eight ounces, in three pints of milk. In five minutes or less vomition took place; the drench came first and then ingesta through mouth and nostrils. There was great distress in breathing and death followed in about twelve hours. The animal took the drench well and was seen eating hay shortly before the drench was administered.

Thousands of animals are dosed for various reasons without apparent ill effects except in the case of red-water. One can understand the animal collapsing at a late stage of the illness, as it sometimes does, when the blood vessels are becoming empty, the blood pressure low and the myocardium failing, but here we are dealing with what appears to be an early stage of the attack. Are these accidents due purely and simply to carelessness, or bottle-drenching, or to some unknown and deeper cause? I am inclined to the latter view. Professor Craig(1) says, "In this condition the animal finds it difficult to swallow and if fluid medicines are administered they may enter the trachea and bronchi and set-up a fatal pneumonia." He appears, however, to be referring to animals in an advanced stage of the illness and having a blood count of 2,000,000 per c.m. There is no doubt that these animals are dangerous to drench. There is a third class of case (red-water) which is also risky to drench and that is the one which refuses to swallow out of sheer disgust at having such a lot of miserable stuff, both food and physic, poured down the throat, day after day. I have no doubt you have all had experience of these happenings and I was so impressed by them in my early days that I sent a note on the subject to the *Veterinary Record*, August, 1893, and which I have reproduced at the end of the paper.* The late Mr. George Arnall, of Bodmin, with a very large experience of red-water, told me at the time that he had seen many instances of the kind in the course of practice.

Vomition. The association of vomition or anti-peristalsis with red-water is peculiar. A case has been noted above. I have known ingesta shot out of the mouth with some force (projectile vomiting) and the animal has survived. This energetic vomition may be less dangerous than a quiet regurgitation and I am inclined to think that anti-peristaltic action may occur during the drenching period, for we must recognise a tendency to vomition in red-water. Late vomiting may occur and it is always serious. Last summer a big cow began vomiting on the third day of the attack and continued to do so until death. In my view accidents are more often met with when animals are drenched whose stomachs are more or less packed with ingesta, whose digestion is in full swing and cud-chewing in progress, or animals which have been driven, or otherwise

worked into an excitable state by which the heart is disturbed. A preliminary fast and period of quiet would be useful in such cases and I am strongly of opinion that all medicines are best administered by tube, but since domestic and home doctoring are so common in red-water, this cannot be often carried out. It should, however, be always adopted for valuable animals, using the nasal route, by preference, in the early stages of the disease.

The Liver. With the liver we must include what is now known as the reticulo-endothelial system, this comprising certain cells found in the liver, spleen, and other parts, but especially in the portal region, and these cells play a most important part in the breaking-down of the red cells, especially the spleen, which is much enlarged, particularly in the early stages of red-water. One approaches this section of the subject with some diffidence, since a whole paper might be written regarding it. The study of the actual morbid processes going on in the body during an attack of red-water has been almost entirely neglected, in this country, since the discovery of the piroplasm, attention having been focussed, since that time, mainly on the number of cells destroyed or the number of parasites in evidence in any particular case, rather than on the mode of destruction of the cells themselves and the effects on the tissues generally of the resulting waste products.

It does not seem that the number of parasites to be found in the blood cells has any definite relationship to the number of the latter, which are or may be broken down, in an attack of hæmoglobinuria. In black-water fever in man the blood counts may fall as low as 2,000,000, but parasites are usually absent, or almost so, from the blood throughout the attack and search is still going on to find an answer to the question "What pulls the trigger?" (Manson), *viz.*: starts the hæmolysis. Parasites are also absent from the blood in paroxysmal hæmoglobinuria, both in man and horses. It seems likely that the piroplasms may set the ball rolling, but it is impossible to say, at present, what factors may be released, or engendered, directly or indirectly, through their action, In any case, the liver is the real clearing house of red-water.

"The liver is the main organ for the removal of products of broken-down erythrocytes; the separation of the iron of the hæmoglobin from the discharged iron-free bile pigment; the discharge of the bile-salts and of cholesterin: the regulation of the sugar supply of the blood and tissues in general, through its glycogenic activities: the regulation similarly of the circulating fats, and storage of the same and other lipoids; the formation of urea. Situated at the head of the portal system, which brings to it the various substances absorbed from the walls of the intestine, the liver acts as a protective organ, arresting and excreting or destroying toxic bodies of various orders." (2) Adami.

The damaged red cells being of no further use as oxygen-carrying units, their hæmolysis, or destruction, is accomplished by the tissues above mentioned. The hæmoglobin is split into hæmatin, and globin and the former is further broken up into an iron-free, and an iron-containing moiety—hæmatoidin and hæmosiderin. The iron-free pigment is excreted chiefly in the bile, which contains an excess of bilirubin (note the bile-stained fæces in red-water), while the iron-containing substance is retained in the tissues for future use. If, however, the free hæmoglobin in the plasma exceeds a certain amount, and cannot be disposed of in the above way, it runs through the glomeruli of the kidneys and hæmoglobinuria results, *e.g.*, red-water and black-water, and equine hæmoglobinuria. Hæmosiderin deposited in the liver and other parts is rapidly used up again in the process of regeneration of the blood. Muir (3).

The above, in a few words, expresses roughly the pathology of hæmoglobinuria and it probably largely explains why in so many infections and re-infections with the piroplasm we get no red-water at all. The liver, kupffer cells, etc., are capable of dealing with the situation and there is no overflow of hæmoglobin to pass off by way of the kidneys. Hæmoglobinæmia (free hæmoglobin in the blood) may have been present, but no hæmoglobinuria has occurred. The globin released in blood destruction is said to act as a toxic body and the stroma of the disintegrated cells may also act as a "foreign protein," and the occurrence of protein shock is thus possible and may account for some symptoms and disasters.

The Vicious Circle. A bile circulation exists normally in the body, wherein certain constituents of the formed bile are absorbed from the bowel, and so reach the liver, to be again excreted with fresh bile. Now in red-water there is a great increase in the flow of bile and this tends to accumulate in the bowel and act as an irritant, and more than the normal amount will return to the liver, which the latter would be better without, since it is already working to its full capacity in ridding the blood of its free hæmoglobin. The bile also tends to become thick and viscid and this means greater effort on the part of the liver to rid itself of the formed bile, for there will be increased resistance with slower flow through the ducts. The increased pressure resistance favours the entrance of bile into the blood stream and the vicious circle is established. It is the easing, or breaking, of this vicious circle which is so important in red-water treatment, for while it exists, not only will the animal be poisoned with bile constituents, but the liver will be handicapped in the performance of its other numerous functions and which have been alluded to above. (It has been said that the liver has thirty-four separate functions.)

Concerning a case of red-water which was not doing well, the farmer said "The house is too clean." It was a practical way of expressing hepatic failure. It may be regarded as an axiom in red-water that if the portal system is kept in good working order the hæmoglobinuria will take care of itself.

Geophagy. Earth Eating. Animals affected with red-water have frequently a remarkable craving for earth. I have seen patients refuse all food, and even water, until they have had a feed of earth. If turned out in a field they at once search for hedge earth. Fine cob is good for them, but cultivated soil such as garden earth should not be given, as it has a high bacterial content. I once saw meningitis follow a case when much garden earth had been supplied the animal. Earth probably has a mechanical action and may act as a gastric sedative. China clay should be useful as it has a cleansing action and adsorbs toxins, but cattle refuse it absolutely.

Post-Mortem Appearances.

I intend here merely to allude to the dry condition of the tissues as seen *post-mortem*. In Hoare's "System," and Wooldridge's "Encyclopædia," it is stated that the flesh is moist and watery and the subcutaneous tissue œdematous, but in the *Veterinarian* of 1833, we find the tissues described as "dried-up." I formerly made many *post-mortems* on animals dead of red-water and invariably found very little blood and less tissue juice; in fact, all fluid seemed to have disappeared from the body and ingesta, and one wondered where it had gone. It seems the exact opposite of what occurs in hæmoglobinuria of the horse. In an acute case of the latter I have seen the tissues appear almost as if water-logged. Some of you may remember Professor Axe squeezing fluid from the muscle in such a case. It is probable that in red-water there is a great loss of chlorides, while, in the horse, there is chloride retention and fluid thus accumulates.

Treatment.

There are three substances of prime importance in the treatment of the disease—water, salt, and glucose. The latter may be supplied directly or indirectly as syrup, or sugar, the animal doing the rest.

Water. Affected animals should have a liberal supply of water, particularly after a dose of salt, but the quantity allowed at one time must vary as to the state of the animal. Too much does harm and if the alimentary canal is becoming torpid may be disastrous; for it then may lie as a dead weight in the rumen or reticulum. If this happens stimulants should be given to rouse the stomach to action. Water promotes action of the bowels and thus relieves the liver, etc., assists in maintaining the blood volume and body fluids, and the elimination of waste products which would otherwise poison the animal. Patients which refuse drink should be given water by tube, or by subcutaneous infusion. Do not give large quantities by tube; it is best to repeat. If the case is advanced begin by the subcutaneous method.

Salines. These should be given in sufficient amount to unload the bowels and an imitation Carlsbad is perhaps the best—soda salts, chloride 2 to sulphate 1, bicarb. $\frac{1}{6}$, add sugar and dilute well. There can be no doubt as to the necessity of obtaining a free action of the bowels, and as early as possible, in the attack. Saline purgatives are tolerated well, as a rule, in the first stages, but are often disastrous if given later. In late constipation I have found aloes and liquid paraffin useful, an ounce of the former, twenty to forty ounces of the latter. Nux vom. and ammon. carb. may also be given.

Subcutaneous Infusion. If the membranes are pale and the animal losing ground, the infusion of glucose saline is of great value, and four pints of normal saline, with four or five ounces of glucose, can be given in about twenty-five minutes. Use an enema syringe and a milk syphon and choose the upper region of the neck or shoulders. If low down the fluid pools. Adrenalin may be added as a stimulant and pressure raiser, but it delays absorption somewhat. A like quantity of fluid may be injected on the opposite side, but I do not know the amount of glucose which one may introduce at one time, as I have never given more than five ounces, but have repeated the latter in a few hours. The fluid should be injected at about 110°F. In the case of a cow which had collapsed on receiving a second pound of mag. sulph. and appeared almost at the point of death, the infusion revived her and she required no further treatment.

Sodium Chloride. If I had to rely on one drug in this disease, I should choose sodium chloride. Apart from any action it may have as a thirst creator, and a laxative, it seems to exert some special influence in restoring the normal condition. Sodium chloride is the chief salt found in the blood, especially in the plasma, and there appears to be a great loss of the salt by way of the kidneys, and by its administration we may be doing something to restore the balance. The subject, however, is too complicated for discussion here.

Magnesium Sulphate. I think this drug best avoided in red-water. Sometimes it acts well, but on the whole the results are disastrous, particularly should a full dose be repeated. It seems almost in some cases to act as a direct poison. The magnesium and sulphate ions are not readily absorbed by the bowel, but this may happen if the portal system contains little fluid and poisoning follow.

Water Clearers. I do not attach any great value to the use of drugs as water clearers. They may have some value as stimulants. If there is free hæmoglobin in the blood the liver has failed, and it is best run off by the kidneys. There is too often over-drugging in red-water.

Rest. I attach great importance to keeping the animal quiet. Movement can only further impair the heart. Roaming over large pastures may be disastrous, especially with company. Animals follow the herd and become exhausted. They should pass through the attack free from symptoms other than those associated with the alimentary tract and the urine. If they do not, the mortality will be high.

Food and Feeding. This is a matter of great importance and I am afraid my views are not quite orthodox. Red-water sometimes sets in like a bolt from the blue. The animal may be feeding and ruminating when the attack is first noted, and the stomachs packed with ingesta, but drenching is carried out in all haste and then something goes wrong and the animal dies. I would fast such an animal some hours before beginning active treatment, then I think fewer accidents would happen. Again, some animals will go on taking a full diet for some days, passing quite black urine the while, no medicine seeming to have the slightest effect. They then suddenly cease eating and drinking, and require the greatest care to pull through. In such cases the diet should be restricted, since much of the food taken can do nothing but add to the burdens of the portal system and hasten the advent of the vicious circle. Sugar, however, may be given. Animals in low condition will, of course, require a somewhat more liberal treatment as they have little tissue reserve.

Carbo-hydrate and Glucose. It would seem advisable and even necessary in many ailments in animals, particularly cattle, to arrange quite early in the illness for the animal to have a supply of glucose. The first of the food principles a fasting animal will exhaust will be his store of carbo-hydrate. When his supplies of glucose are exhausted, or low, his body runs to acidosis, for he cannot

use his fat well without sugar to burn it, and it is also said that the liver is unable to perform its many other functions in the absence of glycogen, and neither fat nor protein can be usefully administered in disease in its absence. I think it advisable, in critical cases of red-water, to administer a few pounds of glucose rather than rely on treacle or sugar, and to combine both the oral and subcutaneous methods of its administration. One does not want to labour the question of acidosis in connection with red-water, but such a condition might and probably does arise, and turn the scale against the animal, and carbohydrate helps. Such food is far more necessary and beneficial to the animal than the so-called nutritious albuminous gruels so often relied on, and the sweet drink will be far more palatable. Gruel in large quantities often nauseates, if nothing worse happens.

Tartarised Antimony and Specific Treatment. Antimony tartate (A.T.) has not infrequently been administered orally in red-water. There can be no doubt that it greatly increases the purgative action of salines, especially the exsiccated sulphate of soda, the combination acting as a hydragogue carthartic, and is perhaps an example of synergic action. I think A.T. of considerable value in red-water, especially in strong animals. It requires to be used with caution and more than ℥ii should not be given or very severe purgation may follow, and it should not be given except in the early stages of the disease.

Specific Action. I have not adopted the intravenous administration of A.T. except in a few cases and I will leave this section to our friends at Tavistock, who have given it a very extensive trial. I append, however, a few notes on its action, when given intravenously in experimental animals, extracted from a paper by Christopherson and Gloyne(5). When injected into the blood stream in a concentration of 1 gr. in 2 c.m. of water it has no action on the cellular constituents of the blood, nor upon the endothelial lining of the vessels, and remains apparently in simple solution in the serum. It seems, however, to have a selective action on certain organs, tissues, and cells, and within a few minutes of reaching the general circulation it has commenced to exert its physiological effects. Amongst these latter are diarrhœa and a desire to micturate. A.T. seems thus to act as a gastro-intestinal irritant, whether given intravenously or orally. Two other therapeutic effects are known: (1) parasito-tropic and (2) organo-tropic (Ehrlich). It is probably the former action (parasito-tropic) that is its supposed specific action in red-water, but since it does not seem to be considered reliable given intravenously, unless combined with the usual remedies for unloading the intestinal canal, it is difficult to decide whether its action, given in this way, is synergic, as above suggested, or parasito-tropic—that is, actually killing the parasite in the blood stream. It would appear that in order to get the best results from specific agents in red-water they should be administered at the time the parasites are invading the blood stream and before actual blood destruction has begun, for it is the foreign material resulting from the hæmolysis (which seems when once started to continue more or less independently of the parasites) that kills, and unless the animal can rid itself of such products, any specific treatment will be more or less hopeless, and when the liver again becomes master of the situation the water clears.

Transfusion of Blood. I quite think that in some cases transfusion, say of citrated blood, might save the patient. Blood can always be easily obtained. It is, however, a difficult proposition. The veins are almost empty and stopping the flow of blood from the jugulars might precipitate a catastrophe, as also might any restraint during the operation.

Many other points remain for discussion in British red-water, but I am afraid that the paper is already too long, and perhaps somewhat technical, although in redressing an old subject this was more or less inevitable. I tender you my apologies.

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Is the Administration of Medicines more Dangerous in Cases of Hæmo-albuminuria in Cattle than in other Diseases affecting them?

By F. T. HARVEY, F.R.C.V.S., St. Columb.

There are some conditions affecting cattle in which the forcible administration of medicines, or even of bland fluids, is undoubtedly dangerous, such as choking, coma, and some other less common conditions, but I am unaware that black-water has ever been mentioned as coming under this category. A case, however, pointing in this direction, is recorded in the *Veterinarian* for February, 1850, by Mr. Cox, of Ashbourne, under the title of "The Danger of Administering Drenches through Bottles instead of Drench-horns." He says, "I found the symptoms not very aggravated or acute." There was no palpitation of the heart, the pulse was 80 per minute, her breathing tranquil, and there was no grunting or groaning. She stood up eating a little hay, her urine was of the colour of dark porter. Being very busy at the time, I left an astringent draught to be given in warm water immediately by Mr. Johnson's man, and an active purge to be given an hour afterwards. After leaving directions as to regimen, etc., I departed. In my return I called to see the cow, and found her dead. On making inquiry I found the draught had been administered with a bottle. She was unwilling to take it and hoosed several times during the operation, and as soon as this was over became very ill. Seeing this they did not wait an hour before the purge was given, and by this haste completed her destruction. I had no hesitation in saying that the medicine had gone down the windpipe and that thereby the animal was suffocated.

Post-mortem. All the internal viscera were healthy except a small portion of the ileum, which was slightly inflamed. On exposing the larynx, trachea and bronchial tubes I found the membrane quite black and their canals were filled with frothy fluid, containing evidences of the medicine and also small bits of masticated hay, both of which had collected within the bronchial tubes. There was a collection of partly masticated hay within the larynx nearly as large as my fist, which the animal in her agony had endeavoured to swallow, though, from the paralysed state of the epiglottis, it had "gone the wrong way," clearly proving that the animal had died from suffocation, arising from giving the medicine out of a bottle.

The interpretation placed on this case by Mr. Cox may or may not be correct, but death appeared to have been due

in great part to the presence of hay within the larynx and trachea and therefore having no particular connection with the bottle. This case of course represents one of the catastrophes of medicine, and is one that might occur at any time either from bad dispensing or careless administration of a draught.

But do these accidents occur oftener in cases of black-water than in other diseases, there being neither paralysis, mechanical obstruction, or difficult breathing to account for the result? I think they do.

Sometime ago I was asked to prescribe for a bullock suffering from black-water. I sent a drench composed of linseed oil, ether and turpentine—ounce each of the latter and pint of the former. I called to see the animal three hours after, and found him dead. I found, on *post-mortem*, that the trachea contained a large quantity of partially masticated food. The large bronchi were almost blocked, the food had apparently come from the rumen, as sometimes happens in parturient apoplexy.

Another case somewhat similar in result occurred a few days since, though I was unfortunately unable to make a *post-mortem* examination. A cow had been ill three days from black-water; the owner had given salts and aromatics. I gave an unfavourable prognosis. Nourishing gruels were ordered and a draught containing nitrous ether and solution of pernitrate of iron given. She became very much distressed, was in great pain, and died about two hours afterwards. In this case the drench was apparently too strong and yet was very simple.

In another case the urine had improved much, but constipation was present. Twelve ounces of sulphate of magnesia, however, seemed to act like a poison. No *post-mortem* was made.

These three cases are typical of several others, either seen or heard of in practice. In no other disease can I call to mind a similar series of occurrences, unless one compares them to what occurs often enough when we give salts in the so-called "grass-staggers" of cattle, or in parturient apoplexy. But the modes of death in these diseases are quite different. Pneumonia rapidly supervening after a dose of medicine is not altogether rare in black-water, and is frequently fatal. Whether it is due to the entrance of food or medicine to the trachea, or whether due to changes wrought in the respiratory centre, it is difficult to say. The occurrence of pulmonary inflammation, however, in an animal suffering from profound hæmal changes and rapid blood destruction, might be expected occasionally, if not quite often.

If it be granted that accidents, or occurrences of the above nature, are commoner in the management of black-water than in most other diseases, and I think they are, to what are they due, and how are they to be obviated? Black-water is very prevalent at present, five or six cases occurring at the same time on some farms, and it is with a view to eliciting information both pathologically and therapeutically that I offer the above remarks. I think we still have to ask the questions: What is black-water? Whence comes the toxic principle which breaks up the blood; is it produced by an entity or by metabolic processes going on within the body? Have we an antidote or cure, or must the treatment remain, as heretofore, expectant? The disease is of sufficient importance to merit considerable attention, for in this disease, as in many others, etiology and treatment lag behind diagnosis. —"*The Veterinary Record*," *August* 19*th*, 1893.

(*To be continued with report of discussion at a Meeting of the Western Counties Division, N.V.M.A., held at Exeter, on 21st March, 1929.*)

There are 88 toll bridges and 55 toll roads in this country. The charges vary very considerably, but it is possible to spend a considerable sum in the course of a comparatively short journey, and there are all sorts of curious charges. At Swinford Bridge, on the Oxford Road, there is a charge of one farthing for every calf, pig, sheep or lamb.—*Observer*.

The Physiology of Ruminant Digestion.

SCOTTISH METROPOLITAN DIVISION'S DISCUSSION ON MR. JOHN HAMMOND'S PAPER.

(*Continued from page* 349.)

The PRESIDENT (Professor R. G. LINTON): I hope you will show your appreciation of what Mr. Hammond has done, the trouble he has taken in writing this paper and in coming up from Cambridge to answer your queries, by having a very good discussion. I am going to ask Dr. Dryerre to open.

Dr. H. DRYERRE: When I was asked to open this discussion I readily assented and considered it a privilege to come to one of your meetings to take part in this discussion, but when I received the paper I found that there was a great deal of matter in it that would require rather more time devoted to it than was available. I therefore decided it would be better to concentrate on one or two parts of the paper rather than to have a diffuse commentary upon it, and in order that the discussion might be confined essentially to the paper, I have one or two headings here to which I intend to keep as far as possible, because they follow the sequence of the subject matter of Mr. Hammond's communication. I am primarily concerned with the question of rumination, but on reading Mr. Hammond's remarks about nutrition in general, I looked for something more authoritative in the way of suggestion as to concrete methods of feeding, and to a certain extent I was disappointed in that, when discussing the question of "lightening" concentrates by adding bulk and fibre to the diet, Mr. Hammond had not been a little more specific in stating what he would consider the actual quantities or relative amounts of fibre or solid material that should appear in the diet.

The Edinburgh school has been working on this problem and although I have not had any practical experience in the matter, I have been watching what has been going on in other departments of the Royal (Dick) Veterinary College, and I cannot help referring to a communication given by you, Sir (Prof. Linton), in Manchester, in May of last year, when you dealt with the subject of feeding calves from birth. There you came down to specific figures. One would have liked to have heard the opinion of an experienced gentleman like Mr. Hammond as to the criteria that you laid down. You, Sir, stated that in your opinion an animal that is in full milk should get 2½ to 3 per cent. of its live weight in solids in its food, and for a dry cow 1½ to 2 per cent. of its body weight, and I should like to ask Mr. Hammond whether he considers these figures really practical, because after all we want to get an authoritative ruling which would act as a guide to others interested in the subject. Incidentally, there was a little point which occurred to me where Mr. Hammond speaks about the feeding of calves, when they are being pail-fed. He mentions that when milk is given under these conditions it is advisable to mix it with water in order to prevent unduly heavy clots in the stomach. That is quite in accordance with practice, but I might be allowed to suggest that one could go further and add some substance such as citrate of soda or phosphate of soda to the water, and thus make the milk curdle in flocculi and so become more readily digestible. That is only a suggestion, and perhaps some of the gentlemen here have tried it. If so, I should like to hear their experiences. There is one other observation I have to make with reference to the question of feeding. There is a statement on page 11 that the large quantities of gas (formed in the rumen, I presume) are eliminated through the usual channels, one of the channels quoted being the "breath." Well, I have a feeling that there must be some misunderstanding here, because it is hardly likely that gas formed in the rumen would be eliminated through the breath of the animal, because that would imply absorption of the gas by the blood stream, its passage to the lungs, and so into the breath. Coming to the matter of digestion, the question of the contents of the saliva is dealt with, and the views Mr. Hammond expresses there are the views published in the references

he gives, and they are in accordance with some experimental work that I did here. I found great difficulty in getting any evidence of ptyalin in the saliva. There is one point to which Mr. Hammond does not refer at all—and it should be kept in mind—that the saliva may have some other function to perform than merely to liquidate the food. I am prompted to suggest that, from observations made on human beings where the œsophagus had to be divided in cases of cancer. It was found that patients eating macerated food which was passed into the stomach suffered more from indigestion than when the food had been previously mixed with their own saliva and then poured down the œsophagus. It is not contended by anyone that the ptyalin in the saliva was the primary factor there. I would suggest there may be a constituent in the saliva of the animal which has a specific activating effect upon those ferments which are present in the diet.

Glancing over the rest of the paper, I concentrated on the question of rumination, and here I felt was a splendid opportunity for Mr. Hammond to have propounded a theory or hypothesis as to how rumination occurs. I think he should have taken the opportunity of being specific and stated that it occurred in this way or that way, and so have thrown the whole matter open for discussion, and let us get down to fundamentals. I think it is unfortunate that he missed such an opportunity. We are given various theories—these theories are diverse and there is no doubt that this meeting will not be able to come to a unanimous decision on the matter; but I think it might help to stimulate discussion if I were to put down tentative suggestions as to how rumination is effected. Therefore I have drawn up here a suggested hypothesis as to how rumination occurs. Certainly I ought to have had a talk with Principal Bradley before I put down these tentative suggestions because has he knocked some holes in them by his reference to the aberrant ruminants. Perhaps he might be able to add something before the close of the meeting, but my suggestion is that you have two distinct movements concerned with rumination: there is the one concerned with kneading up the food in the rumen, and you have another totally different movement, the movement of regurgitation. I would suggest that the contents of the rumen are normally being kneaded by rhythmic waves which pass circularly round the walls of the rumen. My foundations for making such a suggestion and conceiving it possible are based upon the observations of Lewis upon the action of the cardiac musculature in certain affections of the heart.

From the structure of the walls of the rumen, which I have seen through the courtesy of Major Graham, I do not consider that this hypothesis I have put forward is impractical. Then I would suggest that the function of the reticulum might be first as a receptacle for the more liquid portions of the food, the more solid going into the rumen, and periodically as the kneading is proceeding the reticulum is reflexly stimulated to contract, and empties some of its contents into the rumen. The contraction of the muscular bands in the rumen would tend to prevent *pro tem.* the expulsion of the contents from the ventral sac into the dorsal sac, and the reflex emptying of the reticulum would tend to soften down some of the solid mass. I would say, therefore, that the inherent movements of the rumen and the reticulum are concerned primarily with mixing the food. When rumination occurs it is brought about by pressure on the abdomen, effected by the contraction of the diaphragm and a coincident contraction of the abdominal muscles. This pressure on the abdomen would tend to squeeze out some of the contents of the rumen. Now the question arises, why should the contents pass up the œsophagus? Why should the food not pass into the reticulum? Here again I have been indebted to the assistance of the anatomy department, and there they were able to show me that there is an arrangement of the tissue between the reticulum and the rumen whereby, if the diaphragm were to be pressing upon the cranial aspect of the reticulum, the cranial wall would occlude the rumen orifice, and this would prevent the contents passing from the rumen into the reticulum. It has, therefore, no other channel than to go up the œsophagus. This is illustrated in the dead specimen: whether it occurs in the live specimen is not definitely known, but you can see it in the preparation. The anatomy department demonstrated this to me, and pointed out that it was quite possible that this pressure on the diaphragm would make the food pass from the rumen into the œsophagus. The food after being expelled into the lower part of the œsophagus is brought up by a very definite and voluntary act, and this reverse action of the œsophagus I would say was a specific act on the part of the animal. Now there is no great surprise in that, because no doubt some of you are aware that human beings occasionally regurgitate.

One could not say what muscles they are using, but I feel they are mentally controlling it; and if any of you try to make the experiment as to how far back in the œsophagus you can initiate antiperistalsis you will be rather surprised at the result. Now there is no reason to doubt that such a control is in the power of the ox; it has made this a practice through generations, and has no doubt developed the reflex very efficiently. I am putting that hypothesis forward here as a basis of discussion. One wonders how far this hypothesis is supported or refuted by the observations in Mr. Hammond's paper. One observation Mr. Hammond makes is that rumination proceeds after paralysis of the rumen with atropine. Under my hypothesis there is no reason why rumination should not proceed, because the rumen does not contract in regurgitation. Rumination, it is stated, may occur in an animal with an open thorax; this experiment was to eliminate the "vacuum" theory. Flourens observes that rumination goes on after cutting the phrenics, but that the abdominal walls take more part. These observations are quite consistent with the hypothesis I have outlined. Aggazzotti observes that after curara, rumination cannot proceed. That is also compatible with my hypothesis, because curara paralyses the action of the voluntary nerves and therefore paralyses the diaphragm and the abdominal muscles, and so the pressure on the abdominal contents could not occur. Incidentally, however, one wonders if this experiment were correctly executed, because if sufficient curara were given to be effective, then the muscles of respiration also would be paralysed, and the animal could not live.

Again, we see that when the vagi are cut, rumination is suspended. Apart from other reasons rumination is suspended because the animal would lose control of the muscles in the œsophagus. I observe on page 14 of Mr. Hammond's paper a statement that the vagi constitute the centripetal path of the reflex, and rumination is suspended when they are divided. But suspension of rumination after division of the vagi, is in itself no evidence that they constitute the centripetal path, because such cutting of the nerves will at the same time sever the efferent motor fibres which are carried in the vagi.

There is nothing inconceivable in rumination being initiated by a conscious act on the part of the animal. We ourselves eat food, and generally we do so because of the desire to eat: but there is a condition that can be induced in the human being whereby a function of the appetite can be demonstrated. Under treatment by gold chloride an individual loses entirely his appetite, and feeds as a matter of economical necessity, because he is informed that if he does not eat he will die. Thus, the desire for food arising in us, stimulates us to perform certain processes such as mastication and deglutition. If the desire to eat is abolished we do not want to stimulate these processes. Now in the ox we can readily realise it has processes comparable with our own, and in addition it can also control the movements and the functions of its viscera so intimately concerned with storing the food, kneading it up, bringing it back into the mouth and returning it. I can see a difficulty still exists, and that is, why the food did not in the first place go into the omasum and then into the abomasum, and why did it not go down into the reticulum and rumen after mastication?

These points are touched upon in the communication before us, and I think Moczarski's suggestion is a very

feasible one. His suggestion is that the œsophageal groove functions in the adult as well as in the calf. It seems to be admitted that in the calf the œsophageal groove does function, that the groove opens and allows bulky food to pass into the rumen, and that warm or soft foods do not initiate this reflex. One might go further and say that the reflex is not initiated by local stimulation at all but by the animal's mind. The animal may decide, "This is not to go so far as the omasum," or "This particular food is to go into the omasum," and to me there is nothing wonderful about that, because anything we do, whether we are human beings or animals, is done reflexly, and therefore this theory of Moczarski is quite feasible. I can see a difficulty cropping up when you have to deal with only one lip to the œsophageal groove. It is for someone here to try and reconcile these aberrant cases with the hypothesis that I have put forward. Now the opposing view to the suggestion that the œsophageal groove when it is closed conducts the substances direct to the omasum, is based on an experiment quoted in Mr. Hammond's paper where maximum contraction was produced by pilocarpine, and the conclusion was formed that a contracted groove could not conduct the fluid. I am not prepared to accept that conclusion, for very simple reasons. Pilocarpine contracts all those muscles enervated by parasympathetic nerves, and would affect all the muscle fibres in the œsophageal groove. I have had the opportunity of examining a section of the lip of the œsophageal groove. I was given the slide by Major Graham, and I saw that the muscle there is a very strong muscle indeed. I am of opinion that that muscle is not the ordinary plain type of muscle nor is it striped muscle. I consider that that muscle, however, is voluntary.

There are two directions in which the fibres go, and one could conceive what would happen with that muscle. I would suggest that one set of the fibres when contracted would close the groove, contraction of the other fibres would open it. Pilocarpine would cause the contraction of both sets, and the predominant effect might be to open the groove.

The question is: Can you control plain muscle?—and the answer is, Yes. We have plain muscle in our bodies which we can control. There are the ciliary muscles in the eye, and other muscles associated with the larynx supplied by parasympathetic nerves. There is no reason, therefore, why the ox with its parasympathetic nerves should not control the lips and put them into the position it desires, within the limits of the structure.

About the omasum I think I have very little to say because of its complicated and involved structure. One would be inclined to think that the omasum must be there to serve a purpose but, on the other hand, one cannot help being intrigued a little with the idea that it is a vestigial organ. I have not much evidence to support that suggestion: I make it only tentatively to hear what others will say. It seems to me the omasum has not much function to perform in the modern animal, bred by stock-breeders, and the difference in size between the omasum of the ox and the omasum of the sheep could quite easily be accounted for by the difference in the method of feeding of these animals. The intensive, almost forced, feeding of the ox would tend to dilate the omasum mechanically, but in the case of the sheep the feeding would take a much more normal course. It may be that a thousand years after this there will be no omasum left in the sheep or in the ox. There is one statement made by Mr. Hammond in his paper that I can hardly accept, and that is where he says on page 16 that after death the walls of the omasum contract, but that the walls of the other stomachs relax. I do not think there is any evidence that the walls of the omasum contract after death. The contraction is more apparent than real. I think it is more a physical condition which results from the fact that the omasum is filled with fibrous tissue leaves, and retains its shape more than the other stomachs, and this causes one to think that it is in a contracted condition. I apologise for dealing at such great length with Mr. Hammond's paper, but these are some suggestions that occurred to me in reading the paper, and I put forward what I have said in the hope that some discussion will arise, and that criticism, however hard, so long as it is frank, may be stimulated. (Applause.)

Mr. Hugh Begg: I must say I have only read through this paper once, not half a dozen times, but I think it is a very valuable contribution on a most intriguing subject. I have also listened with very great pleasure to Dr. Bradley and to Dr. Dryerre's contribution to the discussion. Probably some of you know that I served something like an apprenticeship at doing practical research in connection with this subject, and I once published a little book on rumination and the observations I had made by day and by night with regard to the practical facts. I do not know whether Mr. Hammond ever condescended to read that paper, but it contains practically all that I know. I do not know that I have added very much to my knowledge of the subject since that time. I have, therefore, been more intrigued by the part of the paper that deals with mechanical digestion than by any other part. I think that little remark that Mr. Hammond makes on page 5 with regard to what I would call the utility of good and bad grasses in their early stages of development requires more attention than we have ever given to it, and I think Mr. Hammond's remark indicates a very striking point—that if a man has got inferior grass in his field he ought to see that it is cut down. I am very glad to see that Mr. Hammond deals with this question of lightening of the food. I have known a man's milk cart to go off the road simply because, being in poor circumstances, he got bean meal and some inferior hay with which to feed his cows, and because of that his cows actually went dry, and his milk cart only went round once a week instead of four times. You see, therefore, that there is a good deal in having a good quality of hay that will lighten the food sufficiently if you wish a cow to digest these heavy concentrates.

With regard to impaction, I notice Mr. Hammond commits himself to this statement—that impaction is frequent in the ox, in spite of the size of the œsophagus. Candidly, I do not think that is so. I think he refers to impaction of the rumen, but that does not amount to pathological impaction. Coming on to the subject of the possibility of men ruminating, I had the opportunity once of having such a case under review. Dr. Haggerty, of Hamilton, sent for me to come over and see a miner who could ruminate at any time. When I went into the man's house Dr. Haggerty said, "Look at this!"—the man began to regurgitate and ruminate, and he did not feel sick at all. By taking up the man's attention the rumination would stop, but I think it is improper to say that rumination is entirely a natural process, because in that case it would occur when he did not want it. I see that a great many of Mr. Hammond's figures agree very closely with computations that I myself made with regard to rumination. I do, however, think that in cross-bred cattle the figures are a little different from the cows Mr. Hammond must have been observing to get his figures. I think no Ayrshire cow is properly chewing the cud unless she is giving the bolus from 58 to 68 cuts. I also think it peculiar that Mr. Hammond has not noticed that probably 50 per cent. of the cows will be cutting from right to left, while the other half will be cutting from left to right, and in each case the first cut is opposed to the subsequent cuts. I have only seen one or two cases in which a cow would throw the bolus to the right side, then to the left and then to the right, with a rhythmic motion. I don't believe that more than one in 500 would do that. With regard to the bolus, many of the boluses weigh from 2½ up to 5 ounces. Indeed, in the summer time, due to the softness of the food and the water mixture with it, I have seen some cows so overfill their mouths that the bolus very nearly came out. Mr. Hammond has drawn attention to the fact that a cow, immediately the bolus enters the mouth, swallows the water that has been squeezed out of the bolus, but he does not draw attention to the fact that she swallows more than the matter that comprises the bolus: she usually swallows at the 25th cut and then at the 45th, and you will see some

cows making an odd movement to the one side in order to effect that swallowing act.

At the very end, just as in the case of the sheep, every cow makes one or two rapid movements that are not very well marked, from one side to the other, and as it were washes down everything. With regard to the question, "How is the bolus sent up?" Mr. Hammond quotes a great many authorities at page 10, I think it is, but he comes to no conclusion himself. Apart from the authors he has quoted, Cheveau's original theory (stated in Smith's Physiology) that it is due to negative pressure in the thorax, is a theory one can very easily accept. It seems to me that the sending up of the bolus is like putting a syringe near to a quantity of material, and if it touches the syringe and suction is maintained, the material comes up with the negative pressure in the syringe. I do not profess to know why only 2½ to 6 ounces are brought up, but it seems to me that is the best solution of the mystery as to how the selection is made and how it is done. I have repeatedly, when I was in practice, put my arm into the rumen of cows that I had been operating on, and I have at that time made a cow swallow material of a bulk and size equivalent to a bolus, and I was surprised by the attempt on the part of the œsophageal groove so to contract in its length as to bring the orifice of the omasum very close to the œsophagus. I found that the œsophageal groove would contract and curve up, and the one stomach would approximate the other. Meantime, it would seem that the diaphragm had come back a bit and pressed a iittle on the abdomen, but I cannot enter into the physiology of the act as Dr. Dryerre has done. Mr. Hammond talks about the animal stretching out its head and neck, but I do not think that is the action: I think it is only a tilting of the chin. There is one thing I want to impress on practitioners, and it is this—not that I want to teach them—I felt in practice that by observing closely how an animal chewed its cud one could very well diagnose some fevered conditions, etc., if a cow was only chewing a cud twenty times. A month ago I saw a cow chewing the cud, and it was not chewing well. The farmer said to me, "I saw her chewing the cud twice to-day and I thought she was all right." Now that cow was dead in 2½ days: it had peritonitis and was not well at all when I saw it. Many practitioners would have thought it was quite well. I say if a cow is at twenty to-day, thirty to-morrow, and forty the next day she is coming back to health, but if she is at fifty to-day and back to thirty to-morrow she is soon going to stop rumination altogether. I found in practice that the observation of these facts was as useful to me as the use of a thermometer in an inflammatory complaint or in any specific fever. These are things of which I took notice for many years when I was in practice. Mr. Hammond has not touched on the value of rumination in connection with yoke oxen. One knows that in warfare it is impossible to get from camels the service you get from horses under stress of very long marches, because they have always to be given a certain amount of food at a time. Ruminants have two appetities. They have appetites to fill the rumen. They get out of condition if they get no opportunity to chew the cud, and I often think this chewing of the cud is not a voluntary act. I have the idea that chewing the cud is Nature's call that the lower alimentary organs are emptied and, reflexly, the cud comes up, and the animal begins to chew the cud, and immediately the lower digestive organs are satisfied the chewing stops, and, although one does not know, there is pressure in the chest, causing the upper blow of the bolus. I do not think there is any doubt at all that there requires to be a certain fullness, and a certain quality and consistency of the fullness in the rumen before it can be done. It is certain that a cow could not continue much longer than it does without the cud after swallowing 25 to 30 lbs. of food, which it does. My figures are very nearly the same as yours. I assume that a cow chews 1 cwt. of food during a full day, and I have tried to collect statistics with regard to the various incidents occurring in a byre which cause an animal to cease rumination. I have some figures with regard to how many cattle stop immediately the milkman comes in to milk them, and how many fewer ceased rumination when you put the machine milker on them, and I think it is very well known to farmers nowadays that the more quiet their animals are kept in the byre, so that they are not interrupted in rumination, the better milk producers do they become. I think it is always a good thing that cows should be regarded as very sensitive animals; they should be regarded as needing the greatest quiet and most kindly handling, if you are not going to interfere with their rumination, and are to have the best results in handling them. I see Mr. Hammond mentions that 35 to 50 strokes of the teeth are usually taken in cattle, 60 in calves and 50 to 60 in sheep, the rate being accelerated towards the end of mastication of the cud. I wonder if Mr. Hammond will amend that statement after having further investigated the matter.

With regard to the omasum, I always regarded that stomach as a kind of policeman of the digestive apparatus, the stomach that stops some culprit fibre that wants to get along when it should not get along into the abomasum. I think the omasum is sometimes considered vestigial. When you look at the omasum and see that it has got these papillæ on each side of its leaves, I think the purpose of each of these inter-spaces between the leaves is essential, because, with one on the right and one on the left, the coarser food particles become entangled between them, and are subjected to friction, and it is admitted that they contain very strong muscles. If these are wrenching constantly at the food to make it fit to pass on into better company, I think the spaces between the leaves are extremely essential. If there were not these spaces how could rumination take place? It has been a great pleasure to me to read the paper, and I thank you for listening to my arguments. (Applause.)

Dr. CHALMERS WATSON, in response to the President's invitation, said: I might say I came here entirely as an interested learner, and have no qualification to speak on the subject, but I may perhaps refer to the extremely interesting morning that I spent in the laboratory in Cambridge some years ago. I was then immensely impressed by what Mr. Hammond showed me, with regard to the significance and great value of his work on reproduction. My only regret was that previously I had known nothing about it, and, for the most part, none of us medical people know much about the exceedingly useful and valuable work Mr. Hammond has done. It is really in that spirit that I came here to-day—to get further light on the subject of rumination. Unfortunately, I had no opportunity of reading the paper, but I glanced through some of the points in it. Certain thoughts occur to me which perhaps may have some bearing on the subject. The first criticism I have to make—it is not really a criticism—is this, that the correct title is not so much the physiology of the ruminant digestion but the physiology of rumination in animals affecting digestion, which is a totally different thing. After all, as one interested in cattle and interested in milk production, one is interested in more than the mechanical changes by which these are produced.

There are several minute points I might mention. One of the sentences in the concluding paragraph of Mr. Hammond's paper interested me very much, when he stated that the rest of the process of digestion in the ruminant is very similar to that of other species. Now the human digestion is not a gastric function at all, the major function of digestion in the human subject takes place in the small intestine, and the first question I ask myself is, under what circumstances are the conditions comparable to those obtained in lower animals? I take it the digestion must, to a great extent, depend on the mechanical conditions in the stomach. Here again is a subject I know nothing about, but one would like to know the effect of hydrochloric acid on digestion in the ruminant. In this connection another sentence in Mr. Hammond's paper caught my eye, the point to which I have already referred, that some 112 lbs. of saliva are used in normal digestion. The function of that saliva must be profoundly important. One of the speakers has already raised that question in a very interesting way, but the function of that

112 lbs. is beyond question. The next point is, is the process of digestion affected by the chemical condition of the stomach prior to passing on ? This brings me to the point of which perhaps we know very little, the actual chemical changes that take place in the lower animals. I was interested in one or two remarks of Professor Bradley. I thought he was going to be much more interesting when he talked of orthodoxy. There again there is a great deal which ought to be subject to review. I have been very much interested lately in certain investigations I myself have done in connection with the process of digestion in the human subject. Digestion processes in the human subject have been extensively studied by giving a test meal—a meal of a cup of tea and a slice of bread and butter, or you may give a corresponding amount of gruel. Then the stomach contents are withdrawn by a syphon every quarter of an hour, or two hours, or three hours, and as the result of that examination there has been obtained a super-structure of knowledge, but, as a matter of fact, that structure is not entirely correct—not that the facts have been wrong, but the basis of observation has not been sufficiently extended ; that is to say, if you extend your test you may get, and not infrequently do get, profoundly different results from the results of the shorter test. I think one of the lines of investigation which would throw light on this matter is a series of observations made in connection with one animal. I think, however, it would be almost impossible in the case of ruminants to determine the influence of food on the stomach. Mr. Chairman, I will make you a sporting offer. I have at the present moment a few young pigs of very little use to me. They happen to be the result of an experiment on breeding which has not turned out very successfully, so if you can find any useful, capable investigator, it might encourage him to carry out some observations by giving these pigs a certain test. Examine them in the fasting stage, then in the process of digestion. Kill one, then another, and then two or three more. These pigs will be available to investigate the condition of hydrochloric acid which is, after all, the guiding condition with regard to digestion. I think points of immense interest and value might be obtained in that way. At any rate, I feel sure of this—if we were to accept the usual teaching of human medicine we would find results that would form the basis for a very interesting discussion in this Society on some other occasion. I can only express again the very great pleasure I have had in being here this afternoon. (Applause.)

Mr. W. W. PEGGIE : I think the Metropolitan Division to-day is extremely fortunate in many ways; in the first place, in having Mr. Hammond, who has come all the way from Cambridge to give us such an extremely interesting paper. My one regret there is that the mystic letters M.R.C.V.S. are not after Mr. Hammond's name. Then we have in our Chairman one of the best-known dieticians of the day, and in our Principal a well-known anatomist.

One point that roused my interest is explained on page 2, where Mr. Hammond says that, according to Wester, the changes which occur in the stomach as the animal grows up are as follows : "In the suckling calf the œsophagus is continued by means of the lips of the œsophageal groove, which at this time, by means of a reflex, forms a tube carrying the milk direct to the fourth or true stomach." If you turn to page 7, at the top of the page, Mr. Hammond mentions that suckling calves do better than calves which are pail-fed. I think these two things, taken together, have some considerable interest. It is a well-known fact amongst practitioners, amongst skilled persons, that suckled calves do better than pail-fed calves. May it be due to the fact that there is something in the saliva ? Professor Dryerre says he has examined a certain number of animals, and found very little ptyalin in the saliva, but there may be something useful in the saliva in the mouths of calves that are suckling. If there is something changed in the manner of taking milk into the mouth, might it not be possible that a good deal of that milk, instead of entering the abomasum, is entering the rumen and causing fermentation ? It is quite a common thing for people to say that their calves are not doing well because of fermentation and indigestion, and probably the indigestion is due to the fact that the calves have been pail-fed instead of suckled. One of the best things, I found, apart altogether from medicine, was to advise the owner to teach the calf to suck : even supposing it was getting the milk out of a pail ; let it suck the milk from the pail, and one finds with that treatment the tympany in the rumen collapses. There is another point on page 5 where Mr. Hammond puts forward a strong plea for grass feeding in the early stages of growth, as the best method of using inferior grasses, and Mr. Hammond says he considers the increase in the yield of milk when cows are first turned out to grass in spring is evidence of this. That is an admitted fact, and I think it is a fact in which insufficient interest is being taken by farmers, and especially dairy farmers, at the present time, and it is for us to advise dairy farmers to erect byres wherever they can. That fact is also being borne out just now in the experiments in grass-fed calves, where the grass is grazed while young and succulent. There is another point at the foot of page 5 where Mr. Hammond discusses the differences in the rate of digestion between concentrates and bulky feeds. Here again, I agree with Mr. Begg that from a practical point of view far too little use is made of the chaff-cutter in feeding the stock. I think much more benefit could be got through our cows if cut straw and cut hay were used. The differences in the rate of digestion might then be revised. There is also one other point that I cannot allow to pass, though it seems to me to be a point with very little behind it, where Mr. Hammond says, towards the end of his paper, that animals ruminate mostly with half-closed eyes (semi-slumber) and seldom when standing. There again, from a practical point of view, I think it is quite a common thing to see animals ruminating or chewing the cud standing as often as when they are lying ; in fact, some animals will not ruminate so freely lying as they will when standing. A matter not mentioned here is the large number of owners of dairy byres who have recently introduced drinking bowls, a very useful adjunct to dietetics. Talking from a cattle practice point of view, where we had a lot of trouble throughout the year, a great deal of our trouble has disappeared through introducing drinking bowls where cattle can mix the water with their food. That has also done away, to a great extent, with the feeding of roots. Many roots can be saved by installing bowls, and these constitute a very useful addition to the farmer's equipment.

Dr. N. WRIGHT : Mr. Hammond has dealt very casually with the question of the bulk or dry matter contents of the food and their relation to rumination and digestion. I think this is a question on which we are at the moment hardly able to say anything. In some experiments made in the south of England an attempt was made to find out whether bulky foods, cold bulky foods or concentrated foods had any difference in actual volume in the stomach. The experiments were carried out by taking the various foods and soaking them in water at 70 degrees, trying to maintain something like the conditions in the stomach. The consequence was that some of the bulky foods—some of the concentrates, for instance—swell to an enormous extent, and it was found that these foods, when they had been allowed to swell as they would in the stomach, occupied a bulk equal to that occupied by dry matter roots. One can hardly talk, therefore, in the present stage of knowledge about concentrated and non-concentrated food so far as the capacity of the stomach is concerned.

There is one series of investigations which I do not find mentioned in Mr. Hammond's paper at all, and I think it is of particular interest. No scientific account of these investigations had yet been published. They were carried out by Drs. Sharp and Amandon in the North Dakota experimental station of the United States. They wanted to investigate the method of rumination, and in order to do so made a permanent fistula into the rumens of about fifty cows. Apparently they had no difficulty in carrying out the operation, and the window made through the side of the animal into the rumen was sufficiently large to enable them to put in their arms, or an electric light or

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anything else necessary to enable them to recognise what was occurring in the rumen and in those parts which they could see or feel. I had a talk with Dr. Sharp on this subject. I am not an anatomist, and I would hesitate to give you a description of what his opinion was. Unfortunately, he has not published a full account of his experiment in a scientific paper, but some of the more popular side of the work is given in a paper entitled "The Ox Stomach," by Dr. Amandon, issued from the North Dakota station.

Mr. W. P. BLOUNT: I think Mr. Hammond has confused the idea that the gizzard, like the omasum, is specialised to deal with fibrous food substances. There can be no association between the gizzard and the omasum, because birds have not got teeth, and that is why they possess a gizzard. Even though the omasum does perform a grinding function, you would hardly expect the thin leaves of the omasum to complete the work of the teeth in any satisfactory manner, after the food substance has been re-ground during rumination. The teeth having performed their duty, Mr. Hammond states that the liquid portion is swallowed, which rather proves that the teeth have done their work, and the fluid contents are passed to the abomasum. Then he says the so-called "pot belly" is caused by feeding too much bulky food. I wonder how he would explain pot-bellied calves reared on milk and milky fluids? Then, speaking on laxative foods, he says laxative roots are excellent, but he also says that bulky foods are detrimental because they retard digestion, but bulky foods are necessary because they are a natural stimulus to peristalsis. On page 2 Wester is quoted as saying that milk enters the rumen in increasing quantities. If so, why are there no cases of regurgitation of this milk; but if it did not enter the rumen then you would not expect regurgitation. Mr. Hammond makes the statement that the peristaltic waves cause one sac to be dilated while the other contracts, and I think it would be interesting to know whether Mr. Hammond could give us some short account of the peristalsis movements over the first three stomachs. The reticulum seems to be a point of contention because, lying as it is, water and nails collect there, and yet why does the heavier food not collect there? If the nails drop down into the reticulum why does the heavy food not drop down into it also? Wester says fluid, in spite of its size, goes to the reticulum. I have not done anything in that connection in the living animal, but in the dead animal, of the fluid you give, some enters the rumen and some the reticulum, and if the diaphragm be fixed it all goes to the rumen. It is suggested that succulent and moist foods pass readily to the third and fourth stomachs. One would expect that the saliva would also go that way, and yet we are told that the function of the reticulum is due to the presence of saliva. Why does the saliva not run there, as does the moist food? Mr. Begg has made some interesting observations on the mechanical posture of the animal during rumination. I wonder if he noted that the blinking rate of the animal during rumination is altered from the normal blinking rate? During rumination the blinking rate slows down to eight seconds, as compared with a three-second inter-blink period; and just as in the case of the observations Mr. Begg made of the number of times the animal swallows its food indicating the health of the animal, so does alteration of the blinking rate vary in health and disease. Mr. Hammond states that Colin in one of his experiments stitched the pillars of the œsophagus, and rumination was allowed to continue, but if he stitched the whole of the pillars nothing could enter the œsophagus at all. I think on page 16 there has been a mistake made, because it says here, "And the anterior papillæ of the omasum are shaped like an arrow, while the posterior are like a file." Smith in his textbook on Physiology states that the anterior papillæ are "harrow-shaped." Mr. Begg suggested that the negative pressure in the thorax is probably one of the best explanations concerning rumination. In the latest statement of Smith's Physiology the thorax has been opened and the rumination continued, which rather gets rid of that question. Mr. Begg also suggested that by contraction of the œsophageal groove it approximated very much the omasum, and the food passed down towards the orifice between the reticulum and the omasum. Whether the lips of the œsophageal groove contract that way or not, the food is naturally transmitted towards the omasum, and that theory sounds very feasible indeed. If the diaphragm is in position you are almost bound to get the food going into the omasum without passing anywhere else. Mr. Begg suggested that rumination is not voluntary because of certain acts, but might I suggest that walking, although originally voluntary, has now become a reflex action. Then again, it is rather difficult to understand why the cow does not vomit when conditions which would cause vomiting in other animals are likely to take effect. I wonder if the question of the "board" treatment of traumatic indigestion in the cow can be explained? If by raising the fore——

Mr. BEGG: Many cows can vomit. I have seen cows vomiting.

Mr. BLOUNT: Then I am sorry; it must be my youth and inexperience. Mr. Begg suggested that by assisting calves when suckling you would bring them to a better state of maturity, compared with calves that were pail-fed. I think one of the features there is that the milk the calves get from their mothers is intended for them, and is given to them at the right temperature, and in proper quantity; whereas when the milk is given by pail it is given at different temperatures and in different quantities. Finally, I have one further remark to make in connection with the bio-chemistry of rumination concerning the presence of rennin. This is supposed to be present in the calf's fourth stomach, and I would like to know if, when they have got past the milk stage, this rennin degenerates.

Professor J. R. GREIG: We students of therapeutics have been waiting anxiously—I almost said impatiently—for a physiologist to give us an account which we could understand of the rumen movement and the chemical changes which precede digestion. At present our theories are tentative, and are based very largely on pure conjecture. Now, I thought, had the human species been constructed with this extraordinary mechanism there might have been some excuse for what happened, because we could not perform experiments directly upon our own species, but there is no such excuse for we veterinary men: we have every opportunity for carrying on investigations, and it is a very significant fact that at this time of day we are still, as this paper and this discussion bear testimony, possessors of views with regard to the movements of the stomach about which we are somewhat hazy, and which are, in regard to the chemical changes in digestion, purely tentative. I am glad to have the opportunity of pointing these facts out. These blind attempts that we have made in the past to treat diseases in ruminants have been a matter of extreme economic importance, and we must in future try to base our arguments upon known facts, in a rational way. For that reason I welcome very much the appointment of Dr. Wright to the Hannah Institute, and with him Professor Dryerre and I will soon be in collaboration, and I trust that before long we will have some information which will be of great benefit to the Division. (Applause.)

Mr. W. NAIRN: Before referring to the paper, I should like, in a word, to thank the members of the Association for the honour they have conferred on me in appointing me President for the year 1929.

I should like to refer to one point that Dr. Bradley raised in regard to the pillars of the rumen. He said there was some doubt as to their function. Now, looking at the sketch on the blackboard, it occurred to me that I might put forward this suggestion: they have a function as muscular tissue, but is it not possible they have a function for the retention of the fluid in the rumen? Without the pillars, is it not possible that the fluid in the rumen would pass away from the rumen, interfering materially with the digestion process of the rumen? I put forward that suggestion as one that appeals to me. I may say, as a practitioner, that with increasing experience one realises the importance of physiology to the prac-

titioner. When one was a student one did not recognise its value, but if one has to make a diagnosis one must be well acquainted with, or have some good idea of, the normal physiology of the animal's body. Reading through Mr. Hammond's paper, it struck me as being very marked that the practical up-to-date breeder to-day, as the result of his own observations of digestion, is operating a system that has within it all the principles advanced by Mr. Hammond to-day. The practical breeder has not studied physiology, but he has realised that to get the best results he must deal in bulk. He also realises that he must give the animal plenty of fluid, not in too large quantities, and the animal must have its fluid at shorter intervals, as fluid is an essential in the ruminant stomach. In fact, a great deal of trouble is due to limiting the amount of fluid in the ruminant. There is one important point that Mr. Hammond omitted in referring to digestion, and that was reference to the importance of exercise with regard to the peristalsis. That point is omitted too much in the feeding of cows, and I know as a matter of experience that, when you come to feeding animals for show purposes, if you omit exercise you will soon come to disaster. I would just ask Mr. Hammond what is the influence of a large draught of cold water on the stomach? Does it suppress the action of the bacterial germs and cause a slowing up of the digestive process? We know that the provision of drinking bowls has increased the milk supply to a great extent, and has also improved the health of the cow. Mr. Hammond mentions the question of tympany when animals are put on to young pasture under wet conditions. There are varying views on this question. No doubt when you put animals out on ground covered with moisture you do get tympany very readily, but practical men found in my district recently that, waiting until the grass had been well washed with rain, the risk of tympany was very much minimised. Can it be that the rain has removed the gas and prevented undue fermentation? He refers on the last page of his paper to impaction of the third stomach or omasum as being the most common impaction of the ruminant. Personally I do not know how you distinguish between impaction of the third stomach and impaction of the first. I should be glad to hear from Mr. Hammond how he makes that distinction, but from the clinical point of view it does not matter, because these compartments have no secretory membrane. Cattle use their muscular cavities for the purpose of preparing the food for true digestion. We recognise that the peristaltic movements are essential to the healthy animal. Our treatment is on these lines, and has been within the last thirty years—that you can increase the fluid contents of the rumen by administering salines, which used to be the usual way, and you can stimulate the peristaltic movement by various products, barium chloride and so on. I must say here that in practice, in dealing with impaction in the ruminant's gastric compartments I have had more success with barium chloride than with salines.

Professor W. M. MITCHELL: I feel rather afraid to rise in the presence of physiologists and anatomists, but I wish to ask for a little help in a problem which I met during the summer, with regard to the size of the stomach in young animals. I find in the paper a certain amount of help, but not sufficient from the clinical point of view, and I wonder whether Mr. Hammond can give me any further assistance.

He says: "The relative size of the parts of the stomach varies with age in correlation also with the nature of the food." The problem arose over an eight months' old bull calf which was sent in with the diagnosis that it had a hair ball or fibrous ball in some part of the stomach. It might interest some of you to hear of the symptoms that this animal showed. It was June when it arrived at the College; two months before that it was first seen by a veterinary surgeon on account of digestive disturbance, associated with tympany of the rumen. Such symptoms would last about two hours at a time, at intervals of two or three days, though there was practically no pain at first. The animal was turned out to grass, but it was noticed to be ill in a similar way from time to time, and had to be taken in at the end of the week as it would not feed. Latterly it had to be bottled-fed, receiving about two quart bottles of milk four times a day. After each feed, however, the animal seemed to be in slight pain, looking round to the flank, the pain disappearing when tympany subsided. Now the problem I was up against was what was causing this abnormal distension: apparently it was some mechanical obstruction which played a temporary part now and again. It was decided finally to perform an exploratory operation on the rumen. My first difficulty arose over the way the animal had been fed. It had always been hand-fed, receiving milk from a foster-mother or by bottle, and I wondered how far the rumen would be developed. I consulted the anatomy department, but I found there was no recorded evidence to help me. It was rather surprising, on opening the abdomen, to find that the rumen did not appear to come back much beyond the level of the last rib; quite different from the fully-developed rumen, which is close to the abdominal wall. After opening the rumen, and putting my hand in, I found simply one small fibrous ball about four inches by two inches by three inches in the reticulum. There was a good deal of fluid in the rumen which was frothy; it was allowed to drain away before closing the operation wound. The bull after the operation had no further trouble, commencing to suckle the foster mother the following day, and has thriven ever since. I think this fibrous ball acted as a ball valve in the œsophageal groove of the reticulum. It may be of interest to know that I passed my fingers when I had my hand in the rumen and reticulum, into the omasum and palpated among the leaves, but found nothing there.

I thought, in reading through the paper, that these facts might be of interest to the members, illustrating the lack of development of the rumen in an eight-months-old animal, and the positive evidence of how a small fibrous ball may derange digestion. (Applause.)

Mr. A. GOFTON: I would like to say, first of all, that I have read his paper with very great interest because, in me, it has stimulated a good deal of thought in regard to digestion. In view of the fact that there are so many here anxious to get away, I am going to confine myself to asking Mr. Hammond one question. He makes the remark, with regard to the omasum, that when obstruction of the stomach occurs it is nearly always in that compartment. Now, that is rather a categorical statement to make. We have passing through our abattoirs for slaughter about 600 cattle a week, and one has there an opportunity of knowing what are the normal characters and contents of the omasum in bovine animals. Now, I cannot recall one single instance in which there has been anything approaching what one would call obstruction in the third stomach, the omasum, and it is for that reason that I would ask Mr. Hammond whether he has ever seen such a thing, or whether it is merely his own statement.

The CHAIRMAN (Prof. R. G. LINTON): Before calling on Mr. Hammond to reply I should like to make a few remarks. First of all, in regard to the growth of the rumen, on which Mr. Hammond comments in the first page; this is an extremely interesting question, and I would like to know if calves were never given any coarse food (what the Americans call roughage) and were only given soft food, if the rumen would fail to develop and if it would be possible to produce a new kind of cow if you never gave cows coarse foods at all? We have arrived at an extraordinarily difficult position, because we are developing cows to be such enormous milk producers, and we have not changed their bodies otherwise, and in consequence of that development there is this extremely interesting and difficult problem as to the amount of bulk and dry matter you should give to cows. To what extent can you reduce the amount of roughage? I think all practitioners will agree with me that you will have a great deal of trouble if you reduce the amount of coarse food to an indefinite extent and give them food very largely composed of bean-meal and other concentrates. What I want to know is, what is the limit to which you can reduce the amount of dry matter in a diet? Then there is one other point: I am not altogether

in agreement with Mr. Hammond in his statement that when cows are first turned out to grass in the spring there is always an increase in yield of milk, and that that increase of milk is due to the increased amount of protein they get from the grass. It has been stated from time to time by agriculturists that the reason of the increase in yield is because the animals have been under-fed during the winter. I am not prepared to accept that statement. Does not the psychology of the animal come very largely into account? One has to consider that the cows are tied up in the byres week after week, and when they are turned out they get fresh air and sunshine, exercise and food rich in vitamins.

THE REPLY.

Mr. JOHN HAMMOND: There have been so many points raised that if I miss one or two in reply I hope I will be reminded of them, because it is difficult to take notes of everything you say. If you will allow me, I will work backwards in the discussion and try to answer the various points. In the first place, I should say that there is a great deal we do not know: I would stress that particularly, because it is perhaps only in the last five years that the question of ruminant digestion has come to the forefront, partly through feeding experiments in reducing bulk, and so on, and partly through the investigations of Wester in Holland, who made fistulæ in cows whereby he could get his hand inside and feel what was going on. I think if his experiment could be repeated here in one of our institutions it would do a great deal more than anything I could say to clear up these mysteries. Now, to deal with some of the later questions—first about cows being turned out to grass in the Spring. I am convinced that there is an increase of milk yield when they are turned out to grass: as to the exact cause of that increase one can only speculate. Proteins and salts, I think, are the basis of the increase. Where you get a high protein you will generally get a high salt content, and the function of the salt is mainly to dissolve the proteins; essential proteins will not dissolve unless salts are present, and therefore they cannot be digested. Then there is the point that several people mentioned about the difficulty of gauging the exact amounts for feeding. I purposely avoided that point. The Ministry of Agriculture report gives the amount of dry matter, and they have issued tables—yards of tables—giving the value of each food substance and so on, but conditions of farm management vary so much in different parts of the country where cows are fed, that if I dealt with one in particular it would be a local affair, not general. What I attempted to do in order to save space was to give the general principles underlying rumination rather than give the details. So far as dry matter is concerned, what really matters is the kind of dry matter. A food may be dry matter which is very soluble, and such dry matter does not count for much; on the other hand, there is certain dry matter, very insoluble, that counts heavily. So, when one says a certain amount of dry matter should be used one should qualify by stating the kind of dry matter, and for that reason I lay stress on the speed of the digestion as being the fundamental thing, rather than the bulk. A point was raised regarding foods swelling: linseed food will swell, but it soon goes into solution. Cold bulky fibre will swell, but it will not dissolve. It is the speed of the digestion, not the bulk of the food, that counts; bulk is only a half-way house, because it slows down the speed of digestion. So far as obstruction of the omasum goes, I must admit that my statement is not based on my own observations, it is based on a survey of the literature which comes from the German—from Scheunert in Leipzig's account. The statement is based on the fact that, when an animal ceases to ruminate, the proper amount of fluid is not taken in, and the contents of the stomach get very dry, caked and hard, and under such conditions food cannot pass through. It is only when the foods are in a fluid state that they will pass along: if the food gets caked and hard inside it will not pass. As for the sizes of the stomachs in young animals, there was a very striking experiment made (you will find it in the German text-books) where they took two young calves of the same age, fed one on milk and the other on a large amount of bulky food. They killed both when they were about six or seven months old, and measured the contents of the stomachs. I think some one raised the point of the influence of large draughts of cold water—do they slow down the rate of digestion? As far as I know, no experiments that I could quote have been made on that point, but one would imagine that they do. I also admit the effect of exercise in stimulating peristalsis, but as the effect of exercise is not limited to the peristalsis, but to the general health and vigour of the body, I do not draw particular attention to it. Then, coming down to the description of the peristaltic movements (I think Mr. Blount dealt with them), I refer you to the curves made by Wester. I do not know if Mr. Blount has seen Wester's account; it is written in Dutch, unfortunately, but he gives some striking features. He had a cow with a fistula, and he not only got his hand into its rumen, but he put in rubber bulbs, which were attached to revolving drums, and took the pressure from time to time, showing how the weight contraction passed over one side to the other, and from this account I gather he imagines these pillars to act in the ordinary way of a churn. You can turn a churn very much better if you have a beater inside, and these pillars, I gather, acted very much in the way of a churn. Then a point was mentioned about the approximation of the stomach openings in the digestion of food, whereby the rumenal opening was drawn up to the omasal opening, It was noted by Wester, with his hand in the stomach, that although the approximation brings the food close to the omasal opening, yet it does not necessarily bring the two points quite together, so there is of necessity a passage between the two. The approximation merely brings the œsophagus and the omasum together; if the food is small it will pass into the third stomach, and if it is large it goes back into the rumen. A small point was raised about rumination proceeding while the animal was standing just as well as when the animal was lying. That will depend very largely upon the habits of the animal. Some animals can be taught to live their lives standing, while others are in the habit of lying down. If cows are in a byre standing for a long time because the space in the byre is limited, these cows will ruminate quite freely while standing, but when cows are used to lying down and have room in the byres, and are made to stand, I think they will ruminate better when lying. There was a tremendous number of questions asked as to whether there was a reflex action in the adult as well as in the calf closing the œsophageal grooves, but I do not think under the present circumstances one could say anything at all about this except by direct experiment. All I could say is that I have read what every one has done, and, as a judge collecting evidence from all the different sources, I have got all the facts, from the llama with its one pillar and from Colin's experiment where he clipped the pillar back—(he did not clip it under as one speaker suggested, he clipped the whole thing right back so that it could not close)—but all those questions will have to wait until some one—I do not know if it will be done here—gets a stomach fistula cow and tests the thing out again. Mr. Begg's paper I think I saw published, but I failed to take a note of it at the time of writing this paper. It was published three or four years ago, and in writing this paper I hunted round for it and I could not find it, and I must apologise for not quoting it. I spent a couple of days trying to find it, but I could not remember where I had seen it, so I did not quote it. I read it at the time with great interest. As regards Professor Dryerre's remarks about the theory of rumination, perhaps I was rather loth to be dogmatic and put forward a particular theory. I think that, until one can get a theory that will fit all the facts, the theory they put forward will only be temporary, and it is better to state conflicting views and then let them be proved by future experiments than it is to lay down definitely some theory that will probably be wrong. The general view, as far as I can gather, is that the

(Continued at foot of first column next page.)

ROYAL COLLEGE OF VETERINARY SURGEONS.

Quarterly Meeting of Council.

PROSPECTS OF WOMEN IN THE PROFESSION.

A quarterly meeting of Council, R.C.V.S., was held on Friday, 12th April, 1929, at 2 p.m., at the Royal College, 10 Red Lion Square, London, W.C.1. Lieut.-Col. J. W. Brittlebank, Vice-President, occupied the Chair, and the following members were present:—Major J. Abson, Dr. O. Charnock Bradley, Prof. J. B. Buxton, Mr. J. H. Carter, Mr. J. C. Coleman, Prof. J. F. Craig, Prof. S. H. Gaiger, Mr. A. Gofton, Prof. F. T. G. Hobday, Mr. J. Holroyd, Mr. R. Hughes, Mr. W. S. King, Mr. G. H. Livesey, Mr. G. H. Locke, Mr. G. P. Male, Mr. J. W. McIntosh, Sir John M'Fadyean, Major-General Sir John Moore, Lieut.-Col. P. J. Simpson, Dr. A. L. Sheather, Mr. S. H. Slocock, Mr. H. Sumner, Mr. E. A. West, Prof. A. Whitehouse, Mr. J. Willett, Prof. G. H. Wooldridge, Lieut.-Col. T. Dunlop Young, Mr. George Thatcher (Solicitor) and Dr. Fred Bullock (Secretary).

At the commencement of the proceedings the CHAIRMAN announced that the President had asked him to tender that day his sincere apologies for not being able to be present owing to urgent matters to which he had to attend.

Apologies for absence were also received from Mr. J. Clarkson, Mr. J. McKinna, and Mr. Trevor Spencer.

The minutes of the last meeting, which had been printed and circulated, were taken as read and confirmed.

Obituary. The SECRETARY read the Obituary List.

CORRESPONDENCE.

(1) The SECRETARY read the following letter:—

"Buckingham Palace,
12*th January*, 1929.

Dear Sir,—The Queen desires me to thank you on behalf of the King for the kind message of sympathy you have forwarded to His Majesty from the Council of the Royal College of Veterinary Surgeons, and to assure you that your good wishes for His Majesty's speedy recovery are much appreciated.—Yours very truly, (*Signed*) A. H. L. HARDING, Capt."

(2) From the Secretary of the Royal Sanitary Institute, stating that the Fortieth Congress of the Institute would be held at Sheffield from July 13th to the 20th next, and requesting the nomination of delegates.

On the motion of Mr. SUMNER, seconded by Sir JOHN MOORE, it was unanimously agreed that the President, or his nominee, should represent the Royal College at the forthcoming Congress.

(3) From the Institute of the Horse, intimating that the subscription of the Royal College as a member of the Institute was due on the 12th January, and requesting the continuation of the association of the President of the Royal College as a member of the Council.

On the motion of Mr. WEST, seconded by Mr. McINTOSH, it was resolved that the subscription be paid, and that the representation of the Royal College be continued.

The SECRETARY read a notification from the National Association for the Prevention of Tuberculosis that the 15th Annual Conference would be held at Newcastle-on-Tyne from October 10th to the 12th next.

On the motion of Mr. CARTER, seconded by Dr. BRADLEY, it was unanimously decided that the President, or his nominee, should represent the Royal College at the Annual Conference.

REPORTS OF COMMITTEES.

FINANCE AND GENERAL PURPOSES COMMITTEE.

Major SIMPSON read the following report of the Finance and General Purposes Committee, and moved its reception and adoption:—

In the absence of the Chairman, through illness, Col. P. J. Simpson, Vice-Chairman, took the Chair at a meeting of this Committee held on 12th April, 1929.

The Minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

The Treasurer submitted his quarterly Financial Statement showing an adverse balance of £1,190 14s. 11d., and liabilities amounting to £378 12s. 8d.

It was resolved that the Treasurer's Statement be approved and that he be ordered to pay the liabilities shown together with cheques for quarterly expenses.

The Secretary reported that during the quarter the sum of £28 6s. 0d. had been recovered in respect of arrears of Annual Fees at a cost in Agent's Charges of £4 7s. 1d.

The Secretary was instructed to take action through the County Court for the recovery of fees in four cases.

An interim report of the Special Sub-Committee *re* Examination Expenses was received. A further report is to be submitted at the next meeting.

A report was received from Messrs. Norfolk & Prior assessing the freehold value of the property of the College at 10 Red Lion Square at a fair market value of £10,000, to include all permanent fixtures, or a replacement value for the purpose of fire insurance at £12,000, excluding ad stained glass windows, architects' fees, and rent.

It was resolved (a) that the Valuer's Report be approved, and that steps be taken to increase the insurance on the building and contents in accordance with their recommendations.

(b) That a Sub-Committee consisting of Mr. G. H. Livesey, Major-Gen. Sir J. Moore, Mr. E. Alfred West, together with the *ex-officio* members, be appointed to take the necessary steps for re-insuring the building and contents for an appropriate sum.

It was resolved that the Treasurer be authorised to invest the donation of £100 received from Mr. A. J. Sewell, M.R.C.V.S., to be added to the capital of the Library Trust Fund.

(*Continued from previous page.*)

food rises in rumination by a combination of the mechanical action of the muscles in pressing upon the stomach, by the inspiratory effort which causes a vacuum in the œsophagus, and by a third fact found by Wester, softening of the œsophagus. That third point is a new one, that as the œsophagus contracts it becomes naturally wider, and it is this shortening, combined with the other two factors, which allows the bolus to form. However, we have only his evidence for it: there is no other evidence and one has to wait until somebody has confirmed Wester's results. In conclusion, unless I have missed any points, may I try and outline the general view which I took in writing this paper? I tried to bring together, to focus in one paper, the results obtained in practice by physiologists and chemists. A theory may go well with one section and be refuted by another section, but if we want the real truth we will have to enunciate a hypothesis that will be accepted by all sections, and it is only by bringing all these views together that we see where the deficiencies lie and where we shall have to begin to make experiments in order to get satisfactory results which will be acceptable to all. (Applause.)

It was resolved that the salary of Mr. F. Newby, Correspondence Clerk, be increased by 10s. per week, 5s. of which to be debited to the Library Account.

Mr. WILLETT seconded the motion, which was carried unanimously.

EXAMINATION COMMITTEE.

Prof. BUXTON read the following two reports of the Examination Committee and moved their reception and adoption :—

A meeting of the Examination Committee was held on Thursday, 11th April, 1929.

The Minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

Correspondence. (a) From Mr. F. T. Harvey in reference to the setting of questions for the written paper in Veterinary Medicine, with explanations in reference to the questions set at the December examinations.

(b) From Professor Whitehouse in reference to the establishment of an examination in general education by the Education Authority of Argyll, and the Secretary's reply, also submitted, was approved.

(c) From Mr. W. O'Donovan making application for exemption from part of the course for the Diploma of Membership. It was resolved that, on the evidence submitted, no concession be granted.

(d) From the Board of Education announcing alterations in the conditions of the award of the first examination for the School Certificate.

It was resolved that the School Certificates issued after 1928 be recognised as qualifying candidates in respect of general education on condition that the candidate passes in the required subjects, and obtains credit in two subjects out of sections i. to iii.

Educational Certificates Nos. 3329 to 3360 were submitted and approved.

An application was received from candidate No. 3178, who failed in Stable Management at the December Examinations, for permission to pass to Class C, subject to his passing in Stable Management at the examination in July next.

It was resolved that the application be not acceded to.

An application was received from the University College of North Wales for approval of the Intermediate Examination in Physics, Chemistry, Botany and Zoology under the provisions of Byelaw 62.

It was resolved that the Secretary be instructed to reply that applications for concessions under Byelaw 62 will be considered by the Examination Committee on their merits.

It was resolved that in view of the evidence as to the nature of his official duties submitted by Mr. J. A. Flynn, he be exempted from the provisions of Byelaw 106 (iii.), *re* the D.V.S.M.

An application was received from a Colonial practitioner to be registered in the Register No. 2 in virtue of the provision of section 13 of the Act of 1881.

It was resolved that the present application be not acceded to.

The Secretary reported that he had communicated to the Secretary of the Board of Veterinary Studies, University of Liverpool, the comments of the Examiners on the nature of the practical teaching in Physics and Biology.

A report was submitted by the Chairman showing the relation of the marks awarded by Internal and External Examiners at the various centres at the examinations held in December.

It was resolved that the report be approved and that the hearty thanks of the Committee be accorded to the Chairman for the care and trouble taken in preparing so exhaustive a report.

It was resolved (a) That a Special Sub-Committee be appointed to consider nominations for election as Honorary Associates.

(b) That the Special Sub-Committee consist of the President, Dr. O. Charnock Bradley, Lt.-Col. J. W. Brittlebank, Professor J. B. Buxton, Professor J. F. Craig, Professor S. H. Gaiger, Mr. A. Gofton, Professor F. T. G. Hobday, Sir John M'Fadyean, Major-Gen. Sir John Moore, Dr. A. Leslie Sheather, and Professor A. W. Whitehouse.

A letter was received from the Colonial Office asking whether the Council would be prepared to recommend certain degrees in Veterinary Science granted in the Dominions as being recognised veterinary qualifications for the purpose of appointments in the Colonies.

It was resolved that the general question raised by the communication from the Colonial Office be referred to the Examination Committee as a Special Committee.

The Chairman submitted draft amendments to the Fellowship Regulations as follows :—

Byelaw 102. To provide that the Special Committee shall be appointed by the Examination Committee and that the Examiners shall be selected by the Special Committee.

Byelaw 103. To provide that the Examiners shall submit their report and recommendations to the Examination Committee and that the Committee, after consideration of the report and recommendations, shall decide as to the award of the Fellowship Diploma.

It was resolved that the proposed amendments be approved and that notice of motion be given for the necessary alteration of Byelaws.

SPECIAL EXAMINATION COMMITTEE.

A Special Meeting of the Examination Committee was held on 11th April, 1929.

The minutes of the previous Special Meeting, having been printed and circulated, were taken as read and signed as correct.

The Committee continued the consideration of the syllabus of examinations in Class C and made certain revisions of the subjects. The consideration of the remainder of the Syllabus was deferred until the next meeting.

Mr. MALE seconded the motion, which was carried unanimously.

REGISTRATION COMMITTEE.

The SECRETARY read the following reports of the Registration Committee :—

Meeting of April 10th.

A meeting of the Registration Committee was held on 10th April, 1929.

The minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

The following cases were considered :—

(A). 2074, P.D.S.A. The Special Sub-Committee reported correspondence with Sir Lionel Halsey in relation to the P.D.S.A.

It was resolved that a request be addressed to Sir Lionel Halsey that he should receive a deputation from the Council on the matter, the deputation to consist of Dr. J. T. Share-Jones, Lt.-Col. J. W. Brittlebank, Dr. O. Charnock Bradley, Prof. F. T. G. Hobday, Mr. G. H. Livesey, and Sir John M'Fadyean.

2215, Crocker, W. H., Using title " Ex-Vety. Sergt., Horse, Cattle and Dog Doctor." This case was referred to the Solicitor with authority to prosecute if sufficient evidence is obtainable.

2225, Name removed from Register. A certificate was submitted that this former member signed veterinary certificates with the title " late Capt. R.A.V.C. (S.R.) and M.R.C.V.S." It was resolved that a prosecution be instituted in this case if proper evidence is available.

2389, Favell, J. W., Using title " late Indian Sub. Vety. Dept." It was resolved that no action be taken in this case.

2390, Homer, Use of title, " Vett." An explanation, which was accepted, was received in this case.

2391, Elliott, E. C., Entry in Directory with title Veterinary Surgeon. The Secretary reported an undertaking from the Publisher that the erroneous entry should be omitted in the future.

2392, Camp, Described in newspaper article as Veterinary Surgeon. The Secretary reported that he had drawn the attention of the Editor of the newspaper to the erroneous description used.

2393, Craske, S., Use of title " Veterinary " in newspaper report. The Secretary stated that he had communicated with the newspaper pointing out the error in the description of Mr. Craske.

2394, Alleged improper use of title. In the absence of proper evidence, this case was struck out.

2395, Riley, J., Use of title. This case was deferred for further evidence.

2280, Horrocks, Use of title. It was resolved that a prosecution be instituted in this case if sufficient evidence obtainable.

(B). *Cases against Members.*

2243, Advertising. It was reported that the offence complained of had now been discontinued.

2254, Employment of unqualified son. Correspondence was submitted in this case, and an explanation from the member was received. It was resolved that the matter should stand over for further evidence.

2322, Employment of unqualified Assistant. This matter was ordered to stand over.

Correspondence was received, together with copies of articles appearing in *The Scottish Farmer*.

It was resolved that the Secretary be instructed to inform the two parties involved that they strongly deprecate the appearance of articles of this kind in the lay press.

A further letter enquiring as to the application of Byelaw 53 (2) to the work of whole-time veterinary officers in connection with licences under the Milk (Special Designations) Order was considered, and the Secretary was instructed to state that in the opinion of the Committee no breach of the Byelaw was involved in the case referred to.

Meeting of April 11th.

The minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

The following cases against members were considered :—

2270, Advertising. This member appeared and submitted evidence showing that he had dissociated himself from the Dog Shop owned and managed by his wife, and was now in practice at a separate address. It was resolved that the evidence submitted be accepted as satisfactory.

2281, Boyd, J. M., Conduct. This member appeared in answer to the summons of the Council to produce evidence of good conduct since the hearing in April, 1928, of the charges of disgraceful conduct made against him. The member had not, however, produced testimonials as to his conduct, and it was therefore resolved that the decision of the Committee be further deferred for three months, and that Mr. Boyd be called upon to produce to the Committee, at its meeting in July next, satisfactory evidence in the form of written testimonials or personal evidence as to his good conduct.

2375, Timoney, T. M., Conviction on False Pretences ; six months imprisonment. This member appeared to answer a charge of conduct disgraceful in a professional respect in that he had been convicted on a charge of false pretences with a sentence of imprisonment for six months. He was represented by Mr. Baker, solicitor, who on behalf of Mr. Timoney admitted the convictions, but produced medical evidence in mitigation of the offences which was supported by witnesses. After hearing the defence, the parties were asked to withdraw.

In their absence, it was resolved to recommend that the Council suspend judgment in this case for six months, and that Mr. Timoney be called upon to appear to present evidence of good behaviour in the meantime to the Committee at its meeting to be held in October, 1929.

2344, Advertising. A satisfactory undertaking was received in this case.

2349, Giving testimonial for proprietary article. It was resolved that this case be struck out.

2352, Name and qualification advertised in local magazine. The Secretary submitted correspondence showing that the member was not responsible for the announcement, and the explanation was accepted as satisfactory.

2358, Conduct. A letter of explanation from this member was received explaining the nature of his services in connection with Putnam's Dependable Service, and it was resolved that the explanation be accepted.

2377, Advertising. In the absence of further evidence, this case was struck out.

2382, Name and qualification advertised in local magazine. Correspondence was submitted showing that the member was not responsible for the appearance of the announcement, and it was resolved that the explanation be accepted as satisfactory.

2383, Advertising. This case was held over for further evidence.

2384, Convicted on minor offence. It was resolved that no action be taken in this case.

2386, Conduct. It was resolved that on the evidence submitted there is no case for action.

2387, Alleged unprofessional conduct. Neglecting to supply proper report after accepting instructions to do so. The Secretary read correspondence from the complainants and from the member, and it was resolved that the Secretary be instructed to address a letter of reproof to the member in regard to his conduct.

2396, Alleged contravention of Pharmacy Act. It was resolved that on the evidence submitted there is no case for action under the Byelaws of the College, and that the Secretary be instructed to inform the Pharmaceutical Society accordingly.

2399, Conduct. This case was deferred for further evidence.

Correspondence was submitted and the Secretary was instructed as to the replies to be sent.

The Secretary submitted draft regulations to govern the procedure of the Registration Committee, and it was resolved that the matter be referred to a Sub-Committee to consist of Messrs. W. S. King, G. H. Livesey, J. W. McIntosh, Lt.-Col. P. J. Simpson, Mr. E. Alfred West, and Prof. G. H. Wooldridge.

A motion for the reception and adoption of the reports was made from the Chair and seconded by Mr. CARTER.

The Council resolved itself into Committee to consider a point, in regard to one particular case, raised by Mr. GOFTON.

On resuming its proceedings in Council, it was unanimously resolved that the report, as amended by the resolution of Mr. Gofton, be received and adopted.

On the motion of the CHAIRMAN, seconded by Major ABSON, it was unanimously resolved that the Seal of the College be attached to the prosecutions referred to in the report.

PARLIAMENTARY COMMITTEE.

Mr. GOFTON read the following report of the Parliamentary Committee and moved its reception and adoption :—

A meeting of the Parliamentary Committee was held on 10th April, 1929.

The minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

A report was received from the Irish Free State Sub-Committee, together with a report of Conferences at the Dominions Office, with regard to the proposal to establish a Register of Veterinary Surgeons in the Irish Free State, the consequential alterations to the Charters of the College and the provision of legislation for the government of the profession in the Free State.

It was resolved—

(a) That the Report be approved ;

(b) That the draft clauses of the proposed Irish Free State Veterinary Surgeons Act as submitted be approved.

(c) That the best thanks of the Council be accorded to Col. Brittlebank for the time and trouble he had given in attending the Conference at the Dominions office.

The Sub-Committee on the Colours and Markings of Animals reported that eight meetings had been held, and a draft scheme of descriptions of colours and markings had been drawn up. It was hoped to present the complete Report to the Sub-Committee at its next meeting.

The following Report of the Joint Committee on Meat Inspection was read.

At a meeting of the Meat Inspection Sub-Committee held at the College on 22nd January, 1929, there were present:—

Representing the College—Sir John M'Fadyean, Dr. J. T. Share-Jones, Mr. Trevor F. Spencer, Prof. G. H. Wooldridge, Lt.-Col. T. Dunlop Young.

Rep esenting the National Federation of Meat Traders' Associations—Messrs. H. Adams, B. Major, E. F. Saville, W. H. Walter, and W. G. T. Blois (Secretary).

In the absence of the Chairman, the President took the Chair.

The Minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

A draft memorandum was submitted by the Secretary showing the grounds on which alterations were required in the Public Health Act, 1875, and setting forth arguments such as could be used by the proposed deputation to the Ministry of Health.

It was resolved that the memorandum be approved, with a verbal amendment. It was understood that the deputation should not seek to wait upon the Ministry of Health until this resolution had first been submitted to the Parliamentary Committee.

It was resolved that the Report be approved, but that the consideration of the Memorandum be deferred until the next meeting.

Draft clauses of a supplemental Charter were submitted and it was resolved to recommend that a petition be presented for the granting of a Supplemental Charter to make the following provisions:—

1. To provide for the election to the Council of four representatives of the Members residing in the Irish Free State, in addition to the present 32 members.

2. To provide that in future the examination fees of students and the registration fee of new graduates shall be such as shall be determined by the Council from time to time by Byelaw.

3. To provide that the Council shall have authority to elect not more than two persons in any one year to be Fellows of the College without examination, provided that they shall have been for at least 20 years members of the College, on such conditions and on the payment of such fees, not exceeding the usual fee for the Fellowship Diploma, as the Council may from time to time determine.

PARLIAMENTARY BILLS. (a) *Local Government Bills.* The Secretary reported that these had now passed into law.

(b) *Coal Mines (Protection of Animals) Bill.* The Secretary submitted correspondence with the promoters of the Bill showing that the recommendations made by the Committee were approved, and that they will be incorporated in the new Bill to be presented in the next session of Parliament.

(c) *Exportation of Horses Bill.* It was resolved that no action be taken.

A copy of the Veterinary Surgeons Ordinance for Palestine was submitted.

The Report of the Colonial Office Committee on Colonial Veterinary Services was submitted, and it was resolved that the matter be placed on the agenda for the next meeting.

A letter was received from Mr. Blampied requesting the services of the Secretary in drafting a new Veterinary Act for the Island of Jersey, and the Secretary submitted a draft which he had prepared.

It was resolved that the draft be approved and that the Secretary be authorised to give any further assistance in his power to assist in the passage of the Bill.

Correspondence with the Colonial Office with regard to the claim of a Colonial veterinary surgeon whose services as an officer in the Territorial Army during the war had interrupted his service as a Colonial veterinary officer, was submitted.

It was resolved that no further action be taken.

The SECRETARY: There is an omission from the report. After the resolution that the report be approved, the resolution should be inserted: "That the best thanks of the Council be given to Colonel Brittlebank for the time and attention he has given to the subject."

Mr. GOFTON: I am glad the Secretary has mentioned that, because the Parliamentary Committee were very enthusiastic about the services Colonel Brittlebank has rendered to the College in this matter.

Mr. WEST: I second the motion for the adoption of the report.

The CHAIRMAN: One leading feature of the report, which I am sure you will be glad to see, is that the Secretary submitted correspondence with the promoters of a Bill showing that the recommendations made by the Committee were approved. That refers to the Coal Mines (Protection of Animals) Bill. It shows how valuable it is sometimes to intervene in these Bills.

Mr. GAIGER: Is there any reason why the annual fee should not be put on a par with the examination fees from students and the registration fee, which are to be determined from time to time by By-law according to the new Charter?

Mr. GOFTON: The annual fee is fixed by Act of Parliament, and not by Charter, and it could only be altered by Act of Parliament, and not by Charter.

Mr. DUNLOP YOUNG: May I draw attention to the proposal with regard to the Memorandum from the Ministry of Health on the second page, where the statement is made "That to this end Section 116 of the Act, 1875, should be amended to read as follows:—'Any medical officer, any veterinary officer appointed for the purpose, or any food inspector holding a diploma in Food Inspection recognised by the Ministry of Health and appointed for the purpose may at all reasonable times,' etc." May I ask that the Public Health London Act of 1891, Section 47, should be included, because the Public Health Act of 1875 does not apply to London at all.

Mr. GOFTON: That report is to be deferred until the next meeting, so that there will be plenty of time for the meeting to consider that, if the Secretary takes a note of it.

The CHAIRMAN: The Secretary will take a note of that and recommend the insertion of the Act in the Schedule.

The resolution for the adoption of the report, as amended, was then put and carried unanimously.

LIBRARY AND PUBLICATION COMMITTEE.

Mr. LIVESEY read the following report of the Library and Publication Committee, and moved its reception and adoption:—

A meeting of the Library and Publication Committee was held on 12th April, 1929.

The minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

The following report of the Library Sub-Committee was read and adopted:—

A meeting of the Library Sub-Committee was held on 9th April, 1929.

A list of books suggested for purchase was submitted and it was decided to recommend the purchase of the undermentioned :—

" Lead Poisoning," J. C. Aub, 1929, 18s. ; " Cows, Cowhouses and Milk," Mayall, 1921, 5s. ; " The Meat Industry," Cronshaw & Anthony, 1927, 6s. ; " The Chemistry of Tuberculosis," Wells, 1923 ; " The Newer Knowledge of Bacteriology and Immunology," Jordan & Falk, 1928, 50s. ; " The History of the Shire Horse Society," Charlton, 21s. ; " The History of the English Cart Horse," R. S. Reynolds ; " The Health of the Nation," Fremantle, 1929, 3s. 6d. ; " The Horse, its Origin and Development combined with Stable Practice," 1911, 9s., Meysey-Thompson ; " The Horse in History," Xazil Tozer, 1908, 4s. ; " A Treatise on two of the most important diseases which attack the Horse . . . that dreadful disease termed Locked Jaw and Tetanus, etc." 1818, 3s. 6d. By William Wilkinson, Veterinary Surgeon.

It was also decided to refer the consideration of the following books to the Library Committee :—" City Milk Supply," H. N. Parker, 25s. ; " The Care and Handling of Milk," H. E. Ross, 1928, 15s.

It was decided to subscribe to *The Journal of Agricultural Research* at a cost of 17s. 6d. per annum.

It was resolved (a) That the question of the purchase of the books referred to in paragraph 2 of the report of the Sub-Committee be deferred till the next meeting.

(b) That the following volumes be purchased :—" A Manual of Helminthology : Medical and Veterinary," by H. A. Baylis ; " The British Pharmacopœia " ; " Traité d'Hippologie," Jacouet et Chounel.

The Librarian submitted a report on the work of the Library during the past quarter, which was received and adopted.

The Librarian submitted a report on the presentations made to the Library during the past quarter, and it was resolved that the best thanks of the Council be addressed to the respective donors.

The draft Annual Report was considered and a number of amendments were suggested.

It was resolved that the correction and completion of the Report be left in the hands of the Chairman, Colonel Brittlebank, Professor Craig, and the Secretary.

It was resolved to recommend that the Treasurer be authorised to invest the donation of £100 received from Mr. A. J. Sewell.

Recommendations were received for additions to be made to the Register which, however, were not approved.

Prof. CRAIG seconded the motion, which was carried unanimously.

DINNER COMMITTEE.

Sir JOHN MOORE read the following report of the Dinner Committee, and moved its reception and adoption :—

At a meeting of the Dinner Committee held on 9th April, 1929, Major-Gen. Sir John Moore was appointed to the Chair.

A list of guests to whom invitations should be sent was drawn up.

Sir John Moore undertook to make preliminary enquiries *re* entertainment and report to the next meeting.

Preliminary consideration was given to the menu and toast list, and the question deferred to the next meeting.

Mr. MCINTOSH : I second the motion.

Mr. GAIGER : Is the date of the Dinner fixed ?

Sir JOHN MOORE : Yes, the 3rd July.

The resolution for the adoption of the report was then put and carried unanimously.

CHAIRMEN'S COMMITTEE.

The SECRETARY read the following report of the Chairman's Committee :—

At a meeting of the Chairmen's Committee held on 10th April, 1929, the President was appointed to the Chair.

It was resolved that a Committee consisting of the President and Past-Presidents be appointed to nominate persons for the office of President, and Vice-Presidents of the College for the approval of the Council.

The CHAIRMAN : I move formally the reception and adoption of this report.

Major ABSON seconded the motion, which was carried unanimously.

WOMEN AND THE PROFESSION.

MOTION BY SIR JOHN M'FADYEAN.

Sir JOHN M'FADYEAN : I rise to move the resolution of which formal notice has been given, and I think perhaps it is as well that I should commence by reading it :—

" The Council of the R.C.V.S., having had their attention called to recent propaganda intended to induce women to become veterinary surgeons, regret to find that the prospects of success for women in the veterinary profession have been greatly exaggerated.

" There is no evidence that the men now on the Register of the R.C.V.S. are inadequate in number for the treatment of animals in this country. In this connection no true analogy can be drawn between medical and veterinary practice, as the considerations that naturally incline human patients to prefer a woman doctor do not arise in the case of diseased animals.

" The Council of the R.C.V.S. are bound to disregard the sex of students who present themselves for the diploma of membership, but they feel that they would be doing less than their duty if they did not make public their opinion that, in competition with men, women in the veterinary profession will always be under most serious disadvantages and that, in consequence, there can be no justification for the exaggerated prospects of professional success that have been advanced in the public press as an inducement to women to enter the veterinary profession."

I hope that the statements contained in the resolution are not ambiguous, and that they will obtain the approval of the great majority of the Council. They appear to me to be incontrovertible and hardly open to serious argument. I will go further than that and say that I do not think if an equal number of other members of the profession to those composing this Council were asked to give their opinion on the matter they would vote for the resolution in a smaller proportion. I am satisfied that the statements made, and the opinions expressed in this resolution, would receive the support of the great majority of the members of the profession. That being so, I have the feeling that the result of the voting which will take place would not be affected by anything that I might say, and that I might perhaps content myself with formally moving this resolution. I think, however, that it may be advisable, in order to prevent misunderstanding and misrepresentation, to say a few words more. In the first place, I foresee it might be said that the things referred to in the resolution are what would, in common language, be called matters of opinion. One can assent to that in a sense, but the question is : If there is room for difference of opinion, whose opinion is likely to carry most weight with regard to the matters referred to in the resolution ? Surely if only a

limited number of persons are to serve as the jury on this question it is this body, this Council, representing the entire profession, whose opinion and decision must be held to be predominant.

I daresay the whole of the members of this Council have seen in newspapers, daily and weekly, the sort of exaggeration that is intended to be dealt with by the resolution. I will read only one as an example:

Professor Frederick Hobday, hon. veterinary surgeon to the King and Principal of the Royal Veterinary College, lecturing to the Union of Women Voters, at Essex Hall, London, said that "no man, however gentle he might be, would ever obtain the response which a sick dog or cat would give to a woman's care and endearment.

"Even with sick horses the animal can sometimes be coaxed to take food by a woman when it has refused to open its lips to a man's blandishments," he said, "I have met with several such instances, one, where the untiring devotion of a professional woman nurse saved the life of a valuable hunter. A good nurse would have very few weeks of idleness, as she would probably be booked up for months ahead if she had a name for being clever in whelping and the rearing of puppies."

"In my opinion," said Professor Hobday, "the first fifty women who specialise in one or other of the veterinary sciences, particularly in the diseases of poultry and game, birds, rabbits, fish, or laboratory research, will make fame and fortune, but they must not expect to come without hard work, for there is no royal road to success in our profession any more than in any other branch of life."

Now I want to make one point clear. If Professor Hobday repudiates the authorship of this statement, that would not remove the necessity for this Council taking notice of it. If the Council think that exaggeration is contained in these statements in the public Press, it does not matter who made them, they ought to be contradicted. The question is: Do the Council think that the paragraphs I have read are free from exaggeration? We all know that when a man is engaged in propaganda he is not supposed to be on his oath, and that a certain degree of exaggeration would be considered a very venial offence. But I think that these statements are objectionable, because they paint an absolutely untrue picture of what the prospects are for women in the veterinary profession, and come perilously near to an attempt to lure women into the veterinary colleges under false pretences. Can anything be more ridiculous than to make these promises to the first fifty women who will come into the profession, whether they specialise or do not specialise? Does anybody know five men who have made fame and fortune in the veterinary profession, either in practice or as specialists, since the incorporation of this College or since the foundation of the Royal Veterinary College? The answer is, No. A further question is: If fifty women can do this, what proportion of the men students who are at present in the Royal Veterinary College, or who may enter next year, are entitled to expect to make fame and fortune in the veterinary profession? I think it is scarcely necessary, speaking to this Council, to show in detail how difficult it will be for a woman to make her living in the profession, not fame and fortune. Perhaps the best way is to consider what would be the prospects of men in the veterinary profession if they were subject to the handicaps under which women must always labour. In the first place, there are certain physical differences between men and women which are all to the advantage of men in dealing, at any rate, with the larger domesticated animals, which are the most valuable animals from the point of view of veterinary practice. Furthermore, it is to be remembered that women are, and probably will be for any time that one can foresee, debarred from serving as veterinary surgeons in the Army, or in the Civil Service at home or in the Colonies. There is not the least prospect that they will get employment even in municipal services or under the Ministry of Health. What would a man graduating at the present moment think of the future if he were told that he was to be debarred from engaging in these services or obtaining any of the appointments which are among the most coveted in the whole profession?

Finally, I think it necessary to emphasise the fact that this resolution, if passed, makes no attack on what are called "the rights of women." This body has neither the will nor the power to discriminate in the slightest degree between men and women students, and I am sure the question of the sex of students will be absolutely ignored, whatever students come before us who have followed the prescribed course of instruction at one of the schools, and only wilful misrepresentation could make the facts appear otherwise. I therefore move the resolution.

Dr. BRADLEY: I should like it to be distinctly understood that, in seconding the resolution, I am doing so from an honest feeling that it is the duty of this Council to express, in some dispassionate and impersonal phrases, the opinion that the prospects of women in the veterinary profession have been somewhat, indeed considerably, exaggerated. I rise to second the resolution with no personal feeling relative to any expressions of opinion that have been stated during the last few months, but I do feel that this Council cannot, if it is in any way actuated by a sense of its responsibility, remain absolutely silent. It must express an opinion of some sort. I am able to second this resolution because of the extraordinarily careful and dispassionate phraseology that has been used in its construction. It is a phraseology that we should expect from the framer of the resolution, and our expectation is certainly justified in the wording; and it is largely because of this careful and dispassionate phraseology that I feel that I can wholeheartedly second the resolution that has been moved. There is no bias shown in this resolution either towards or against any of the schools, and I think there is no part of the resolution to which any exception whatsoever can be taken. If there is a possible shadow of exception it would be to the first sentence of the second paragraph: "There is no evidence that men now on the Register of the R.C.V.S. are inadequate in number for the treatment of animals in this country." Though some might be of opinion that the profession is not overcrowded, but rather undercrowded, it will be very difficult indeed to show that the lack of men is in the direction of the general practitioner. I think we are perfectly convinced that the number of suitable men for Colonial appointments is scanty, as has been shown by the recent report of the Lovat Committee. That the number of men as a whole is not scanty might be admitted, but the number of suitable

men is certainly below what one would wish. It is not a matter of quantity; it is quality that is wanting in this, as in so many other, professions.

I think I need not weary the Council by saying anything further. I simply say that it is my honest opinion that we must, in fairness to ourselves, express a resolution in the terms just moved by Sir John M'Fadyean.

Major-General Sir JOHN MOORE: I hope that this resolution will not be agreed to. I hold no brief at all for women, but I fear that if this is made public in any shape or form it will raise such a storm of criticism that it will do injury to this College, and moreover it will probably react on Sir John himself. If this appears in print we shall immediately have all the women in the world, or in England anyhow, against us, and we shall never have any chance of receiving any benefactions or subscriptions or donations to any Building Fund, or anything else in the profession. The way I look at it is this. If this is made public in the newspapers and letters are written about it, Sir John unwittingly becomes the greatest propagandist of all for the women's movement, and for that reason I am sure it will be very unwise to pass the resolution, and it will be much the best course to wash the resolution off the slate altogether. As I have said, I do not hold any brief for women, and I do not wish to discuss the pros and cons of the question of women entering into our profession, but you cannot limit the aspirations of women nowadays. Women are admitted into the engineering, the medical and other professions; if they wish to take up the welfare of animals instead of the welfare of human beings they are perfectly entitled to do so; and if you oppose them in any shape or form you are only, in my opinion, making matters worse. Sir John made mention of the word "living"—that she could not make a living. I wish, perhaps, just to descend from the practical to the levity side of the matter. He has not considered perhaps the finest partnership—the partnership of the woman graduate and the man graduate. We have now seven women in the profession, and three of them have married veterinary surgeons. I just mention that as a side issue. I do not think there is anything exaggerated at all in the matter, and I trust that the resolution will be thrown out. In any case, I hope it will not appear in the public Press.

Mr. HUGHES: I think it is very proper that this resolution should be brought before this Council. We are the guardians of the profession and we direct its activities and its prospects. Speaking from the standpoint of a general practitioner who has chiefly to deal with large animals, I think there are departments in our profession that are unsuitable for women—I allude to the department of obstetrics. I have yet to learn that a woman is superior to a man as a nurse for a horse, at any rate. There are many aspects of the duties of the general practitioner that would not appeal to, or attract, a woman of fine instincts.

Prof. WHITEHOUSE: We have heard Sir John M'Fadyean's resolution and his speech upon it, and we have also heard a speech from Sir John Moore practically contradicting it or disproving it almost word for word. I wish to take somewhat of a middle course. There are statements in Sir John's resolution for which I could not possibly bring myself to vote; and with regard to the tone of it, while one cannot absolutely say that this or that is not so, it seems to me unkind and discouraging to those plucky young women students who are already at the College. I would like the resolution to be toned down. The statement in Sir John's resolution which I think might well be withdrawn is that "There is no evidence that the men on the Register of the R.C.V.S. are inadequate in number for the treatment of animals in this country." I suppose some of you have seen that our College has been running a sort of Employment Bureau for its members, and that has put us in very close touch both with young men who wanted employment and with the people who were ready to employ them. It is quite clear that in the higher lines, the public appointment lines, and the higher paid staff, the shortage is extraordinary. I do not think it is worth while giving instances. For the Colonial Office, for the head of a Research Institute, they say they would not know where to turn to find a suitable man.

The CHAIRMAN: May I point out that the paragraph mentioned refers only to the treatment of animals in this country?

Prof. WHITEHOUSE: Very well, Sir. I have looked up the careers of sixty-one of our graduates who have qualified since 1924. All of them are at work except two or three, who are at school. Fourteen are in practice on their own account in that comparatively short time; twenty-two are assistants, and the others are employed in various ways in public work. During the last ten days I have had to write to five practitioners telling them that I could not find them assistants. All the time I have had more applications from practitioners than I have had from young men for jobs; they are all at work. That, I think, will answer that point. It is evidence, although it is from one place only. The rest of the resolution is more a question of tone, and I am hoping that Sir John will agree to a resolution drafted from that point of view. I admit that there is need of a warning, and I do hope that Sir John will agree to the amendment which I will now read:—

"The Council of the R.C.V.S. feel it their duty to address themselves to women who contemplate entering the veterinary profession, pointing out that in spite of the great present demand for recently-qualified men both in service under public bodies and as assistants in general practice, this demand has not hitherto been extended to women.

"Sex has proved no handicap at the Colleges, and most of the actual work of the profession can probably be performed by a woman equally well as by a man, but it still remains for public bodies and owners of livestock to be convinced of these facts, while some professional activities will always be more conveniently undertaken by men.

"In view of these considerations it is unlikely that, for some years to come, qualified women can expect to be absorbed into professional work in numbers at all comparable with those to which men can look forward with certainty. The Council of the R.C.V.S. therefore express the earnest wish that (in the interests of women themselves) no form of propaganda be undertaken that may induce large numbers of young women to attend the veterinary colleges."

I would like to say that I am working at propaganda at the high schools in the region from which we wish to draw our students, and that some of the headmasters send their

girls as well as the boys up to me. While I tell the boys what they ought to achieve, I say, "This is not true for you girls. You cannot expect the same chances that the boys have. You have a lot of prejudice to break down. You are just as good students, and you can do the work just as well, sometimes better, than the men, but we cannot promise you anything. We will do what we can for you, and we welcome you, but you have got to look forward possibly to no success at all."

It is in that tone that I want to move this resolution. Mr. Hughes has referred to obstetrics. I can tell Mr. Hughes that I know of one girl student who is quite a good hand at it. She attends to all the cows that she can possibly get in a large practice, and she can do the work just as well as any man of veterinary capabilities can. I move that as an amendment.

Mr. DUNLOP YOUNG: To put it in order I will second the amendment.

Mr. SUMNER: I would like to say one thing with regard to the motion which Sir John has moved. I may be susceptible to rather small things, but to my mind the third paragraph has a bite in it at the end, and I think it might come out. The third paragraph reads: "The Council of the R.C.V.S. are bound to disregard the sex of students who present themselves for the diploma of membership, but they feel that they would be doing less than their duty if they did not make public their opinion that in competition with men, women in the veterinary profession will always be under most serious disadvantages." Of that I approve. It is in the remaining portion that the bite comes: "and that, in consequence, there can be no justification for the exaggerated prospects of professional success that have been advanced in the public Press as an inducement to women to enter the veterinary profession." That, I think, is a bit unkind. I am not here to advance the prospects of women in the veterinary profession, and the veterinary profession, so far as I know it, is not particularly anxious to incorporate women into it for practice amongst the domesticated animals. I hope Sir John will consider the point I have raised. The Council may think with me, or may not think with me, but personally I think the concluding portion of the sentence is rather biting.

The CHAIRMAN: You do not move any amendment?

Mr. SUMNER: No.

Prof. HOBDAY: As Sir John has specifically mentioned my name in connection with this matter, I should like to say that I do not think it quite nice of him to have said that these are exaggerated prospects, and I certainly could not vote for this resolution in its present form. I think the best answer I can give to you, if you want an answer at all, as to the prospects of women in the profession, is to say that you will not stop them coming in; and by moving this resolution we are giving them the greatest propaganda to come in that has ever been given to them. We do not want the Colleges flooded; we do not want too many of them. We only have sixteen at our College now, but that we are going to have a lot more I can see from the letters that are coming in. But I do not think it is fair to say that because Sir John has specifically mentioned me by name that this, therefore, represents that *I* have given an exaggerated idea of the prospects in the profession. If Sir John had not mentioned me personally, I should not have felt so strongly about it, but I do not think it is fair that it should have been put in this way. I should like to read to you some letters I have received from ladies who are already in the profession. I had not time to do much, because I did not attach any great importance to Sir John's resolution when first I saw it on the Agenda. I simply thought, "I will write to those ladies who are already in the profession and see whether it is true when it is said that they have had exaggerated prospects put in front of them as compared with the men in the profession." I do not think Sir John realises what canine practice in this country means. One-third of the practitioners on our Register are getting their living out of canine practice nowadays, and *I* have not asked for the women to come in and take the canine practice out of our hands. I have here three letters from ladies. There are seven ladies qualified, and three of them are married, as Sir John Moore has said. Two of them are married to veterinary surgeons, and from what I know of them and of their husbands, they will be good helpmates. In fact, one is in practice on her own account, as a help to her husband who has a public appointment. She practises under her own name. Her husband does his work solely from the public appointment point of view. Nobody can deny that the first lady graduate made good. She had a big practice in Ireland, and did it well, too. I think it is most unfair to put the resolution in such terms, and I do not think that Sir John realises what he is saying when he proposes it. Let me read three of the replies to my letters. I simply wrote to these ladies and asked them what they thought were their prospects in the veterinary profession as compared with women who entered other professions. They are pioneers, and the pioneers always get knocks on the head if they can be given to them. You and I have had experience of that and we shall have it again. The first letter says: "Dear Professor Hobday,—In reply to your letter asking for my opinion of the veterinary profession as a career for women, I do not consider that at present the profession offers either to men or to women adequate financial reward for the time, money and mental effort spent in qualifying. As regards women veterinary surgeons, I can speak with experience only of practice. I consider that in town practices, women have about equal opportunity with men, the degree of their success depending almost entirely upon the district. In country practices, except amongst the few better educated farmers, men have a very decided advantage." That is what Mr. Hughes says. These women do not want to go into cattle practice. Why should they? The practice of the healing art on the smaller animals is just as noble as on the larger. "Unfortunately, the country is infested with quacks, who are well able to obtain supplies of drugs, and also professional aid in consultation and for operations. As long as this state of affairs exists, I could never advise anybody to enter the profession." Here is another letter I have received:—"Dear Major Hobday,—I received your letter to-day, and so will give you my opinion as you wish. I do think that provided a girl is really fond of work amongst animals and passes the college course satisfactorily and is not afraid of hard work, there is no reason why she should not have prospects of a livelihood as good as other professions open to women, provided she has a suitable post or

practice and in the right place. But I do think work amongst the smaller animals or research work is the greatest opening in the profession for women." This lady is with a veterinary surgeon who has expressed the opinion to me more than once that he would rather have her as his assistant than all the qualified assistants he has had during the previous ten years. She has been with him now a considerable length of time. This is the third letter: "Dear Prof. Hobday,—In reply to your letter of 8th inst., with one or two reservations which I would rather not try and hold forth upon just now, my answer to your question is in the affirmative." I do not hold any brief for women. We cannot stop them coming in and we might just as well welcome them when they come in. I am bound by my duty to do that in my position.

Prof. BUXTON: It seems to me that already a variety of odoriferous fish has been drawn across the trail we are trying to pursue. There is a tendency at the moment to get right away from the lines of the resolution which has been moved by Sir John. In the early part of his remarks Sir John referred to the fact that in so-called propaganda statements are made which usually include some degree of exaggeration, and I am quite prepared to admit that so long as no harm is likely to accrue from that exaggeration it does not very much matter. But the statement has been made that a very considerable number of women who enter this profession are destined to achieve fame and fortune. Is anybody prepared to guarantee that the next fifty men who enter the profession are going to achieve fame and fortune? If they are not prepared to admit or guarantee that, what is it that will enable women to achieve things which are debarred to men? Sir John has shown perfectly well that various services are closed, unfortunately perhaps, to women, and are likely to remain closed. What does it then resolve itself into? According to the statement, women must specialise in one or other of the veterinary sciences—I do not know how many veterinary sciences there are—and as a continuation of that it is said that they must take up the study of the diseases of poultry and game, birds, rabbits, fish, or go in for laboratory research. I was not aware that there was very much scope for the study of the diseases of fish at the present moment—not sufficient to bring fame and fortune. I also was not aware that there was sufficient demand for the services of women in research institutes far in excess of that which exists for men at the present time. What does the position come to, then? That the only or the principal outlet for them is in general practice. I am not prepared to say whether women are better fitted for general practice than are men, but no doubt other members of Council can fill that deficiency. But, remember, they are to have preference over men in this practice (Cries of "No, no.") They are to have preference over men because they are guaranteed fame and fortune, and men are not. (A voice: "Rubbish.") Dr. Whitehouse has presented what he has conceived as an amendment, and after obvious travail his effort has miscarried, for the result of his labour is nothing more or less than a poor caricature of the hoped-for original—is, in fact, I submit, a very carefully concealed advertisement of prospects in general, and is redundant with inexactitudes. I strongly support the resolution which Sir John M'Fadyean has so very necessarily proposed, because I feel that if by any chance the first fifty women who enter the profession do not achieve fame and fortune the first people to whom they are going to refer their ill-luck will be the Council of this body for sitting quiet and taking no notice while this matter was under discussion, and I submit that we cannot sit quiet and take no notice. If we have a shadow of doubt in our minds as to the truth of this statement, it is our duty to make our opinion public property.

Prof. GAIGER: I should like to support this motion, but I feel I cannot do it as it stands, largely because of the first sentence in the second paragraph. After hearing the discussion as far as it has gone, I am inclined to ask Sir John if he will accept an amendment from me which slightly alters the first paragraph and deletes the last two paragraphs. I would like the first paragraph altered by taking out the words "regret to find" and inserting in their place "desire to express their opinion"; and instead of the word "success," to insert the word "employment." It would then read as follows: "The Council of the R.C.V.S., having had their attention called to recent propaganda intended to induce women to become veterinary surgeons, desire to express their opinion that the prospects of employment for women in the veterinary profession have been greatly exaggerated." I think if we leave it at that we shall do what we intend to do—convey that there are no very great prospects, no exaggerated prospects. At the same time we should not discourage the women students who are already in the colleges; nor should we put in the first sentence of the second paragraph which I think is misleading, where it says, "There is no evidence that the men now on the Register of the R.C.V.S. are inadequate in number for the treatment of animals in this country." I formally move an amendment on the lines I have suggested.

The CHAIRMAN: That is a further amendment, the amendment being that paragraphs 2 and 3 be deleted, and the first paragraph be altered by the insertion of the words "desire to express their opinion" for "regret to find," and by the insertion of the word "employment" in place of the word "success." Is that further amendment seconded?

Mr. COLEMAN: I will second it.

Prof. WHITEHOUSE: In view of this second amendment, I shall be pleased, with the consent of my seconder, to withdraw my amendment.

The CHAIRMAN: I presume the seconder agrees, so that the original amendment is now withdrawn in favour of the amendment moved by Professor Gaiger.

Prof. CRAIG: I shall be glad to support Professor Gaiger's amendment if there are added to it the last three and a half lines of the original proposition, because I think the amendment would be incomplete without it. We do not at the present time know to what extent women can be, or will be, employed in this country.

The CHAIRMAN: Will you specify what particular portion of the original resolution you refer to?

Prof. CRAIG: I think the following portion of the original resolution should be added to the amendment: "There can be no justification for the exaggerated prospects of professional success that have been advanced in

the public Press as an inducement to women to enter the veterinary profession."

Prof. GAIGER: I cannot accept that. I do not think the amendment requires it if it stands as I have put it.

The CHAIRMAN: Prof. Gaiger will not accept that. Do you move it as a further amendment?

Prof. CRAIG: You have so many amendments before you, Sir, that I will leave it as it is for the moment, at least until the first amendment is disposed of.

The CHAIRMAN: Thank you very much. Does anybody else want to speak?

Mr. LIVESEY: In supporting the resolution, I should like to say that I think its essence is in the three and a half lines which Professor Craig has read. No matter how it is turned and twisted, it is absolutely necessary in the interests, not only of our profession, but of the public, that those last three and a half lines should be passed by this Council and be published in the public Press.

The CHAIRMAN: Now, gentlemen, are you all finished? Are you ready to vote?

Sir JOHN MOORE: I want to move a resolution in the terms of what I said, which I think I am perfectly entitled to do.

The CHAIRMAN: You can move an amendment.

Sir JOHN MOORE: I move, "That the resolution be not agreed to, and that it shall not be made public in any shape or form as it is likely to lead to injury to the R.C.V.S."

The CHAIRMAN: That is a direct negative. I shall have to rule that anything with regard to publication must follow afterwards.

Sir JOHN MOORE: Am I not entitled to move an amendment? Other people are doing it.

The CHAIRMAN: You can move an amendment, but yours is not an amendment, it is a direct negative. So far as the second portion of your amendment is concerned, if I may call it an amendment, with regard to the question of publication, that does not arise now, but I am perfectly prepared to discuss it after the matter is decided. Do you follow me?

Sir JOHN MOORE: Yes.

The CHAIRMAN: I think it is the only regular way in which to conduct our business. Is there any further discussion? If not, I will now put the only amendment that is before the Council—the amendment moved by Professor Gaiger.

Prof. GAIGER: Am I too late to make an alteration?

The CHAIRMAN: I am afraid you are.

Prof. GAIGER: It was for the purpose of trying to meet Prof. Craig's objection.

The CHAIRMAN: I am afraid you have already burnt your boats. The amendment before the Council is:

"The Council of the R.C.V.S. having had their attention called to recent propaganda intended to induce women to become veterinary surgeons, desire to express their opinion that the prospects of employment for women in the veterinary profession have been greatly exaggerated."

The amendment was then put and lost.

The CHAIRMAN: Before I put the original motion, does anyone desire to move any further amendment? I hope not. If not, do you wish to reply, Sir John?

Sir JOHN M'FADYEAN: I think the Council would probably prefer that I should abstain from any reply. I hope those who have definitely expressed opposition to the resolution, or sought to amend it, will not think me discourteous if I say that I do not think anything has been said that serves to discredit the resolution; in short, I wish to leave the matter to the judgment of the Council as it stands.

The CHAIRMAN: I will now put the resolution moved by Sir John M'Fadyean, seconded by Dr. Bradley.

The resolution was then put and carried, 13 voting for and 7 against.

The CHAIRMAN: Now, Sir John Moore, I shall be able to give you an opportunity now the resolution is disposed of. The only question which can be put is the desirability or otherwise of publication.

Sir JOHN M'FADYEAN: On a point of order, Sir, I should like to say that the resolution commits us to publicity. It expresses the opinion that the Council "would be doing less than their duty if they did not make public their opinion." I certainly should never have drafted the resolution in any other way in face of the open propaganda in the other direction.

The CHAIRMAN: Does anyone desire to move that the Council go into committee? If not, we will pass on to the next business.

Mr. MALE: What do we intend to do with the resolution—publish it in the veterinary press?

The CHAIRMAN: In our veterinary press.

Sir JOHN M'FADYEAN: I take it that it means that it is not subject to any restriction whatsoever, as in the case of any business done by the Council?

The CHAIRMAN: No restriction whatsoever.

Sir JOHN MOORE: Will you test by vote the desirability of its publication?

The CHAIRMAN: No. I am prepared to go into committee if the Council wish to do so. I think the point of order raised by Sir John M'Fadyean is effective, and I am bound to support it.

The next business before the Council is "Notices of Motion."

NOTICES OF MOTION.

The SECRETARY: On behalf of the Chairman of the Examination Committee, I beg to give notice of consequential amendments to Bye-laws approved by the Examination and Parliamentary Committees, which will be suspended to-day.

To alter Byelaws 102 and 103 to read as follows:—

Bye-law 102. The Thesis shall be submitted to a Special Committee appointed by the Examination Committee, who shall (a) decide the section or sections into which the subject-matter of the Thesis falls, (b) select two or more Examiners from the recognised list to whom the Thesis shall be submitted for examination and report.

Bye-law 103. In the event of the Examiners recommending the acceptance of the Thesis, the candidate may be required to present himself at the Royal College of Veterinary Surgeons or at such other place as may be determined to be further tested either orally or otherwise at the discretion of the Examiners in that branch or those branches of Veterinary Science to which the subject of the Thesis belongs but it shall be within the discretion of the Examiners to recommend the rejection of the candidate without such further test. Each Examiner shall make a separate report to the Examination Committee on his

examination of the Thesis, and on any further examination of the candidate. In case the Examiners shall, upon examination of the Thesis and of any other contribution or contributions to the advancement of Veterinary Science submitted by the candidate, hold the same to be generally or specifically of such excellence as to justify the exemption of the candidate from any further test, the Examiners shall set forth the fact in their report, giving the grounds for their recommendation, and the Examination Committee shall have power in such case to exempt the candidate from any further test.

Alteration to Schedule I. To insert in Paragraph I (c) after the words "The Senior Certificate Examination of the Central Welsh Board," the following:—

Certificates granted on the results of the above examinations are recognised provided that the candidate has at not more than two examinations attained a pass with credit in English in Group I, in at least one language in Group II, and in Mathematics in Group III.

Jubilee Memorial Prize. To amend Rule 1 of the Rules for the award of the Jubilee Memorial Prize.

In line 2 omit the words "since the date of the previous" and insert in place thereof the words "within the four years preceding the date of the."

Retirement of Mr. Slocock.

Mr. Livesey: I beg the permission and the indulgence of the Council to draw attention to a matter which I think ought to be referred to before we break up; I refer to the fact that when we meet again we shall miss one of our old companions. To our great regret we have heard that Mr. Sidney Slocock is not seeking re-election at the forthcoming Council election ("Hear, hear") and I do not think we can possibly let him leave us without expressing to him our thanks and appreciation for all he has done for us during the past 20 years. All too frequently I am afraid in this country we have good men amongst us and make use of their services, but we wait until they have departed from this life before we say how much they are appreciated. We let our eulogy wait until it becomes an elegy, but we must not do so in this case. Mr. Slocock is one of an old type of veterinary surgeons, very valuable indeed in this country, which is becoming unfortunately only too rare. He is a man who has been held in very high esteem by all his brother practitioners as a skilled veterinarian—a man of extraordinary powers of diagnosis and a man who has been held in the very highest esteem by a large circle of clients. We on the Council have particularly to thank him for his services. For many years past Mr. Slocock has been a very keen and ardent supporter of all veterinary societies. Wherever there has been a great gathering of veterinary surgeons he has almost invariably been found amongst them. For 19 years past he has been a member of the Council of the Victoria Veterinary Benevolent Fund—a fund which has every reason to thank him most cordially for all he has done for it, and from 1914 to 1927 he occupied the honoured position of President. On the Council of this College he has been sitting amongst us for 20 years, and during that period he has by no means been an idle member. Let me remind you of his energy and let us ask ourselves how many of us can emulate what he has done. In eight of the past ten years he has not missed a single Council meeting, and in many of the years he has not missed a single committee meeting. (Cheers.) During the past ten years alone he has been summoned to 167 committee meetings of which he has attended 132. During the same period he has been called to 94 Council meetings, and of those he has attended 92. (Cheers.) That is a record of which any man might honourably be proud, and it is a record on which I think we ought to congratulate him. During his term of office as President he inaugurated the habit, I might say, of the President visiting different parts of the country. That was very greatly appreciated by members of the profession, and I am glad to say his example has been followed by succeeding Presidents, to the benefit of the profession. Gentlemen, I do not want to keep you long, but I wish to move, with your permission:—

"That this Council has heard with great regret of the coming retirement of Mr. Sidney H. Slocock. It desires to express its thanks to him and to place upon record its deep appreciation of his valuable services to the profession and to the Royal College both as President and Vice-President and as a Member of Council for a period of 20 years. That a copy of this Minute be sent to Mr. Slocock signed by the President and countersigned by the Secretary." (Cheers.)

The Chairman: Gentlemen, I am sure you will permit me, although I occupy the Chair to-day, to second this resolution, not for that reason only, but because it is a distinct pleasure to associate myself, without eloquence, with all the sentiments expressed by Mr. Livesey. I am sure that anything that this Council can do or say to add to anything that Mr. Livesey has said with regard to our appreciation of the services rendered to the profession by Mr. Slocock we shall most willingly do. I wish personally to pay tribute to Mr. Slocock for many examples which he set in the Chair of this College. I can only say, in seconding this vote of appreciation, how much I personally regret, and I feel sure all of you sitting here to-day regret, Mr. Slocock's decision to retire from amongst us and seek the well-earned rest, which many deserve, but which many feel they cannot take. His absence will be a distinct personal loss to each one of us on this Council. (Cheers.) There can be no question that in this Council whatever differences of opinion may arise from time to time, on questions of policy, there is an extraordinary wealth of fellowship and affection which develops amongst the men who sit in this Chamber, but no man that I know of is possessed with a greater capacity for disseminating that spirit of affection than our friend Mr. Slocock. (Cheers.) I have very great pleasure, although with a good deal of regret, in seconding the resolution that the best thanks of this Council be passed to Mr. Slocock in the terms of Mr. Livesey's motion.

The resolution was carried by acclamation.

Mr. Slocock, who received a very warm welcome on rising to reply, said: Mr. Vice-President, Mr. Livesey and Gentlemen, I thank you one and all. May I make one request? It will be greatly treasured by me, Sir, if your name could appear on the resolution as occupying the chair to-day. (Cheers.)

The Chairman: If it is the wish of the Council I shall be delighted to sign. (Cheers.)

This concluded the business of the quarterly meeting of Council.

XUM

DIVISIONAL REPORTS.

Western Counties Division, N.V.M.A.*

Annual Meeting at Exeter.

The forty-fifth annual general meeting of the Western Counties Division, N.V.M.A. was held at the Royal Clarence Hotel, Exeter, on March 21st, and was attended by one of the most representative gatherings in the Division's history. Mr. H. K. Roberts, the President, occupied the Chair, and the other members present were Messrs. W. Ascott, W. G. Blackwell, J. Dunstan, E. R. Edwards, W. Fyrth, G. H. Gibbings, F. T. Harvey, J. K. Irvine, H. B. Kauntze, G. D. Lansley, C. Masson, S. J. Motton, W. B. Nelder, E. J. L. Norman, J. M. L. Penhale, R. E. L. Penhale, W. Roach, R. G. Saunders, E. J. Thorburn, and the Hon. Secretary and Treasurer, Mr. R. Barons Nelder. The Division also welcomed the presence of the following visitors:—Messrs. Holman Berry (Ministry of Agriculture and Fisheries), T. A. Shaw, H. G. McShane, and E. A. Wilshaw.

Obituary.—Before the commencement of the ordinary business, the CHAIRMAN referred with regret to the death of a very respected member for many years, Mr. E. R. Smythe, and a vote of condolence with the widow and family was passed in silence. A similar vote was passed with the widow and family of Mr. Golledge, who was at one time a member.

The minutes of the last meeting, as published in the *Record*, were taken as read, and were signed as correct.

Correspondence.—(1) Apologies for absence from Messrs. E. C., E. W., and L. W. Bovett, J. Forbes, W. H. James, R. H. Penhale, A. G. Saunders, R. H. Smythe, and W. N. Wright.

(2) From the Secretary of the National Horse Association asking for support. The Hon. Secretary intimated that the N.V.M.A. contributed £5 5s. On the proposal of Mr. MASSON, seconded by Mr. R. E. L. PENHALE, the letter was allowed to lie on the table.

(3) A letter regarding the supply of veterinary biological products. On the proposal of Mr. ASCOTT, seconded by Mr. ROACH, it was decided to support the Mid-Wales resolution urging the "National" to take steps to stop the supply to chemists and laymen.

(4) From Major J. Cochrane-Dyet, Wiveliscombe, resigning membership on account of leaving the district and stating that he had disposed of his practice to Mr. Hall. The resignation was received with regret.

Nomination of Members. The following new members were nominated for election:—Mr. E. D. B. Hall (Wiveliscombe); Mr. P. W. Bloye (Plymouth)—members were especially pleased at the return to membership of Mr. Bloye after recovery from a prolonged period of indifferent health—and Mr. H. G. McShane (Honiton).

Election of New Members. Mr. L. W. Bovett (Bridgwater), and Mr. A. R. Smythe (Falmouth), were unanimously elected members.

Hon. Secretary's Report.

The HON. SECRETARY (Mr. R. B. Nelder) presented his report for the year as follows:—

"During the past year there have been three meetings of the Division and two Council meetings, with attendances well up to the average. At the Annual Meeting, in addition to the usual business, there was a discussion on 'Swine Fever,' illustrated by many specimens kindly lent by the Ministry of Agriculture. At the Autumn meeting, a very instructive paper on 'Early Veterinary Science' was contributed by Mr. Masson, whilst the Summer meeting was given up to clinical items and specimens.

"I am rather disappointed that our younger members are not more frequent contributors with papers at our meetings, but hope that this omission on their part will soon be rectified. On the other hand, what may be called 'The Pillars of the Society' never fail in any emergency, for which I am extremely thankful.

"I would like to draw attention to Article 3 in the Rules for borrowing instruments, which states 'that the borrower shall return the instruments in a clean and undamaged state.' I know that it is only a want of thought, but sometimes they are returned in a very bad condition, and if the borrower would just apply a little oil to them after drying, it would make the task of cleaning them much easier.

"Four new members have been admitted during the year and three names have lapsed, one unfortunately by death.

"Our best thanks are due to Mr. Motton for his work on the Council of the N.V.M.A., and to Mr. Edwards for auditing the accounts."

Treasurer's Annual Statement of Accounts.

In his capacity as Hon. Treasurer, Mr. Nelder proceeded to make the following statement:—

"The finances of the Division continue to be satisfactory, and I can be very brief, because you have already had a copy of the audited Balance Sheet sent you.

"There is a slight increase in both the receipts and the expenditure; the latter, however, is not alarming, being due to a few extra items not likely to occur next year.

"We have two delinquents, I am sorry to say, who have not paid their subscriptions, one of them being two years in arrear. I have done my best to show a clean sheet, but in spite of this there are therefore two blots on it, which I hope and trust will not happen again.

"I now formally move the adoption of the report and accounts, which you have before you."

The reports were unanimously adopted and appreciation of the Hon. Secretary's services was voiced by Mr. ASCOTT.

Election of Officers.

On the proposal of the CHAIRMAN, seconded by Mr. GIBBINGS, Mr. W. Fyrth (Bridport) was elected to the *Presidency*. Mr. Fyrth consented to act and intimated that he would endeavour to attend the meetings regularly. Other nominations of the Council were: *Vice-Presidents*, Messrs. H. K. Roberts, S. J. Motton, E. W. Bovett and W. N. Wright; *Hon. Secretary and Treasurer*, R. Barons Nelder; *Assistant Hon. Secretary*, E. J. L. Norman; *Hon. Auditor*, E. R. Edwards. These were unanimously approved and the following were elected as the *Council* on the proposal of Mr. ASCOTT, seconded by Mr. ROACH: Messrs. Fyrth, Edwards, Masson, J. M. L. Penhale, Wright, and the Hon. Secretary and Assistant Secretary. Mr. Fyrth, Mr. Motton and the Hon. Secretary were elected *Representatives on the Council of the N.V.M.A.* on the proposal of Mr. MASSON, seconded by the CHAIRMAN.

Place of Next Meeting. On the proposal of Mr. R. E. L. PENHALE, seconded by Mr. HARVEY, it was decided that the next meeting of the Division should be held at Plymouth.

* Received on 1st April, 1929.

Free Treatment for Sick Animals of the Poor. Following a discussion in committee on the proposed sick animals' scheme, a resolution was passed agreeing to the principle of the scheme and making certain recommendations as to its operation.

Extension of Council of N.V.M.A. A discussion also took place on a letter from the "National" regarding a proposal for increasing the representation on the Council by means of 25 elected representatives. After hearing the views of the Division's members of the Council, the meeting agreed not to favour the proposal as it stands. If it was found necessary to increase the number of the N.V.M.A. Council, it was felt that this should be done by increasing the number of the representatives from each of the Divisions. A resolution to that effect was carried.

Paper by Mr. F. T. Harvey. The PRESIDENT now called for consideration of the paper by Mr. F. T. Harvey, of St. Columb, on the subject of "Some Points in the Natural History and Therapeutics of British Red-water."

Mr. F. T. HARVEY, introducing his paper, which had previously been circulated to members, said that as they not infrequently discussed rare things, he thought a paper on some well-worn subject would be of interest. So far as he could see, the disease had not been dealt with by any veterinary surgeon, viewing it from the advanced physiological point of view, in recent years. If they could advance the treatment of it on rational lines it would be of great advantage.

[Mr. Harvey's paper is reproduced at the commencement of this issue; the report of the discussion follows next week.—ED.]

A hearty vote of thanks was accorded Mr. Harvey on the proposition of the CHAIRMAN, seconded by Mr. R. E. L. PENHALE, and thanks to the Chairman, on the proposal of Mr. MASSON, seconded by Mr. NORMAN, concluded a most successful meeting.

R. BARONS NELDER, *Hon. Secretary.*

Scottish Metropolitan Division, N.V.M.A.*

ANNUAL MEETING AT EDINBURGH.

The annual meeting of the above Division was held in the Royal (Dick) Veterinary College, Edinburgh, on Wednesday, 21st November, 1928. The President, Professor R. G. Linton, occupied the Chair, and the following gentlemen signed the Attendance Book:—

Members: Messrs. A. Gofton, W. Wallace Peggie, John Taylor, J. Ker, J. Aitken, J. F. Player, T. M. Inglis, S. Robson, T .Grahame, Major Graham Williamson, Messrs. J. P. Walker, Hugh Begg, Major R. G. Anderson, Professors W. M. Mitchell and J. Russell Greig, Principal O. Charnock Bradley, Messrs. Wm. Anderson, H. M. Wilson, Edward J. Duncan, Esmond Brown, P. Fisher, P. Wilson, W. Nairn, H. F. Downie, J. N. Ritchie, Major A. Baird, Mr. W. Lornie, and the Hon. Secretary, Mr. W. C. Miller.

Visitors: Messrs. W. Lyle Stewart, S. Grassovsky, W. T. Edwards, W. P. Blount, Dr. C. B. Voge, Dr. A. Calder, Dr. Chalmers Watson, Messrs. F. Darling, A. D. Buchanan Smith, R. J. Scott, A. B. Fowler, W. D. Macrae, Dr. H. Dryerre, Mr. J. E. Wilson, Dr. N Wright, Messrs. T. L. Levick, K. Keylasmier, J. S. Steward, L. H. Mills, D. H. Aldis, S. R. J. Cussen, E. Clark, D. Reenes, C. P. Downes, H. Cronly, J. J. Gildea, C. B. Davidson, and D. Kennedy. There was a total of 64 present, certain gentlemen omitting to sign the book.

The Minutes of the last meeting, having been printed in the *Veterinary Record*, were taken as read, and there being no discussion upon them, they were approved and signed by the President.

Apologies for absence were intimated from Mr. John Brown and Mr. Geo. F. Boddie.

Obituary. The President referred to the death of one of the very old members of the Division—Mr. William D. Connochie, of Selkirk. He requested the members to pay tribute to his memory by standing for a few moments in silence. This was duly observed.

Secretary's Report. The Secretary submitted a brief report of the year's work. Three meetings had been held, with an average attendance of 37, of whom about two-thirds had been members. The total number of members was 66; resignations during the year were six in number, and there had been eight new members elected. The finances of the Division showed a balance in hand of £14 8s. 10d.

It was decided, on the motion of the PRESIDENT, to accept the report.

ELECTION OF OFFICE-BEARERS.

The President intimated that he wished to nominate as his successor in office, Mr. William Nairn, of Blairgowrie, a member who, he said, did not require any introduction. Mr. T. M. INGLIS seconded, and there being no other nomination, Mr. W. Nairn was elected *President* for the forthcoming session.

The President requested the Secretary to read over the list of those gentlemen who had been recommended by the Council for election, as follows:—

Vice-Presidents: Professor R. G. Linton, Mr. W. Wallace Peggie and Mr. T. M. Inglis.

Mr. A. GOFTON proposed and Mr. J. TAYLOR seconded, that these gentlemen be elected.

Members of Council: Mr. Gofton, Mr. Taylor, Professor Mitchell and Mr. H. M. Wilson.

Auditors: Mr. J. Taylor and Professor Mitchell.

Hon. Secretary and Treasurer: Mr. Wm. C. Miller.

On the motion of Professor J. RUSSELL GREIG, seconded by Mr. P. WILSON, these gentlemen were elected to their respective offices *en bloc*.

Election and Nominations of New Members

Mr. Jamieson, of Haddington, who had been nominated for membership at the last meeting, was elected to membership, and the Secretary intimated receipt of the following nominations: Mr. W. Weipers, Major E. D. S. Robertson, and Mr. W. P. Blount, of the staff of the Royal (Dick) Veterinary College, and Mr. John Cameron, of Berwick-on-Tweed.

"The Physiology of Ruminant Digestion." The PRESIDENT then introduced Mr. John Hammond, of the School of Agriculture, Cambridge. He explained that a paper on rumination was thought to be eminently desirable in view of the rapid development of the husbandry of both beef and dairy cattle. Mr. John Hammond's name was well known in connection with the physiology of reproduction in the rabbit and the cow, and he was sure that his

* Received on 2nd April, 1929.

paper on rumination, copies of which had been printed and circulated before the meeting, had been read with great interest by them all. Before asking Dr. Dryerre to open the discussion, the President called upon Dr. O. Charnock Bradley, who gave a descriptive account of the salient points in the anatomy of the ruminant's stomach, mentioning, in particular, the differences which existed in certain of the aberrant ruminants, such as the camel, llama, etc.

[Mr. Hammond's paper was published in last week's *Record*, the discussion upon it is reproduced earlier in this issue.—Ed.].

At the conclusion of the discussion, the PRESIDENT said: Gentlemen, from the Chair I am going to ask you to accord Mr. Hammond a sincere vote of thanks for the trouble he has taken to prepare this paper, and for the careful way in which he has listened to the discussion. I assured him when we were having lunch to-day that he would get a very good discussion on his paper, and, for once, I have been a true prophet. (Applause.) I now ask you to accord Mr. Hammond a very hearty vote of thanks. (Renewed Applause.) Mr. Hammond, I am extremely grateful to you, and I wish to pass to you the thanks of the Association for all the trouble you have taken.

Mr. HAMMOND, acknowledging the vote of thanks, said that it had been a very great privilege for him to come there and listen to the remarks made at that meeting, because one's experience was very much limited in research institutes, and it was only by obtaining the general view and criticism from all points that one made any advance. For that reason he felt that it was he and not they who should be returning thanks. (Applause.)

Tribute to the President. Mr. GOFTON: Before we go I want to ask you to accord your President a very hearty vote of thanks for his services in the Chair. This is the last occasion on which Professor Linton will appear as President. I am not going to anticipate the vote of thanks that will be given to him when he demits office at the next meeting, but I think this Division is very much indebted to him for arranging the paper to which we have listened to-day. (Applause.)

The PRESIDENT: Will you allow me, in one word, to thank Mr Gofton for his remarks and you for your very cordial reception of them. It has been a very great pleasure to me to have presided over this Division for the past two years, and especially to have arranged this meeting in connection with Mr. Hammond's paper.

W. C. MILLER, *Hon. Secretary.*

PERSONAL.

Veterinarian's Masonic Honour.—Mr. E. Lionel Stroud, who has been Treasurer of the Central Veterinary Society for over the last quarter of a century, was one of the distinguished Freemasons who received honours at the meeting of The United Grand Lodge of England, held at the Central Hall, Westminster, on April 24th, being appointed Grand Standard Bearer. Mr. Lionel Stroud, whose interest in the "Central" is known and appreciated by so many readers, takes as great an interest in Freemasonry, and besides having received the honour of London rank, is at the present time Provincial Grand Senior Deacon of Kent.

Will.—BLAKE, Mr. John Vickers (83), of Monkton Street, Ryde, Isle of Wight, veterinary surgeon to Queen Victoria at Osborne (net personalty £1,571), £2,216.

From The Veterinarian, April, 1828.

On Prize Essays by Pupils.

TO THE EDITOR OF THE VETERINARIAN.

Sir,—Your well-known attachment to, and zeal for, the improvement of that profession which has the honour of ranking you amongst its members, assure me that the following suggestion will meet your attention. A thorough conviction of its utility in advancing the respectability of future veterinarians has induced me thus to venture to offer it to your notice. I propose that, each month, you offer a subject to be discussed by pupils (not having attended the college) of private practitioners. Praiseworthy ambition is predominant in the mind of youth. Frank and generous, they need not pecuniary remuneration, and the insertion in *The Veterinarian* of the best essay will be a sufficient stimulus to exertion. By this means a spirit of emulation—that great incentive to industry—will be diffused amongst them; each will use every endeavour, will call forth every latent spark of talent, to gain the meed of fame. Not content with what they may merely hear or read, they will be convinced by ocular demonstration alone; and, to gain ocular demonstration, they must and will have recourse to dissection. Thus, out of the great number of young men who annually enter the college, a few at least will commence a course of close and profound study, with some degree of preparation; they will in youth have acquired habits of research and industry, which in manhood they will have no inclination to discard. Anonymous writing ought to be discouraged in young men, therefore it would be advisable that every communication should be made under a proper signature. However, I leave the subject for your consideration, confident that the decision you may come to will be for the good of the profession.—Yours, etc. W. H.

Royal Institute of Public Health.

ZURICH CONGRESS, 1929.

Mr. Howel V. Hughes, one of the hon. secretaries of the Veterinary Medicine and Meat Hygiene Section of this Congress, which will be held from May 15th—20th inclusive, drew the attention of our readers last week to the value and importance of members of the profession in this country affording all possible support to this newly-instituted Section. Complete sectional arrangements will not appear until the final programme is published, but the preliminary programme gives the information that the President of the Royal College (Professor J. Share-Jones) is Joint-President of Section VII. (Veterinary Medicine and Meat Hygiene) with Professor W. Frei, Director of the Veterinary Institute of Pathology and Bacteriology of the University of Zurich. Amongst the numerous vice-presidents are Mr. Hugh Begg (Lanark), Lt.-Col. J. W. Brittlebank (Manchester), Professor J. B. Buxton (Cambridge)—Professor Buxton is also the official representative of the N.V.M.A. at the Congress—Mr. E. P. Edwards (Mold), Mr. J. Howard Jones (Glamorgan), Mr. T. Eaton Jones (Liverpool), Mr. T. F. Spencer (Kettering), and Lt.-Col. T. D. Young (London).

Two of the three hon. secretaries are British veterinarians, Mr. R. L. Higgins (London) acting in that capacity in addition to Mr. H. V. Hughes.

To Investigate Sheep Diseases.—In connection with the movement to establish a research station at Cockle Park for the treatment of obscure sheep diseases, it is hoped to resuscitate the Animal Disease Committee of the Northumberland Agricultural Society to help forward the work. A local fund, it is suggested, should be formed, which would be ancillary to any grant obtained from the Ministry.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Aug. 31st to Sept. 6th.—N.V.M.A. Congress at Ayr.

May 6th.—Meeting of the Editorial Committee, N.V.M.A., 10 Gray's Inn Square, W.C., 4-30 p.m.
„ 9th.—R.C.V.S. Council Election—Last day for Nomination of Candidates.
„ 17th.—Meeting of the Midland Counties Division, N.V.M.A., at Nottingham.
„ 18th.—Entries due for D.V.S.M. Examination.
„ 23rd.—R.C.V.S. Annual Report and Voting Papers issued.
„ 30th.—R.C.V.S. Council Election—last day for receipt of Voting Papers.
June 6th.—R.C.V.S. Annual General Meeting.
„ 14th.—R.A.V.C. Annual Dinner.
„ 17th.—D.V.S.M. Examination commences in Edinburgh.
July 3rd.—R.C.V.S. Annual Dinner.
„ 4th.—R.C.V.S. Committee Meetings.
„ 5th.—R.C.V.S. Council Meeting.
„ 9th.—R.C.V.S. Written Examinations.
„ 11th.—R.C.V.S. Oral Examinations begin.

R.C.V.S. Obituary.

Oliver, E. W., Junior Naval and Military Club, W.1. Graduated London, 17th May, 1889. Died 16th April, 1929.

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Professor T. W. Cave.

Both Veterinary Science and Agriculture have sustained a severe loss in the death of Professor Thomas W. Cave, F.R.C.V.S., Vice-Principal of the South-Eastern Agricultural College, Wye, and for 27 years head of the Veterinary Department of the college, which occurred on Thursday of last week at the age of 70. The *Times* says:—

"In addition to lecturing to degree and diploma students on veterinary subjects, Professor Cave carried out extensive researches and experiments with a view to elucidation of various diseases among cattle and sheep. He devoted years of investigation to the mysterious disease known as "struck" sheep, which has caused severe losses to flock-owners all over the country, and particularly to those of Romney Marsh. He was regarded as the leading authority in the country on this subject. He was very much liked by everyone with whom he was associated, and was an extremely able and lucid lecturer. The value of his work at the college was reflected in the many successes obtained by students who received his tuition. Professor Cave also delivered addresses at hundreds of meetings of branches of the National Farmers' Union and agricultural organisations throughout the province of the South-Eastern College, which includes the counties of Kent, Surrey, and Sussex. Before going to Wye, Professor Cave was a member of the staff of the old Midland Agricultural College, Nottingham, and during the war he served in an advisory capacity to the Ministry of Agriculture in matters relating to veterinary work.

"The memorial service at Wye Parish Church was attended by the Governors and the whole of the staff and students of the South-Eastern Agricultural College."

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The late Colonel Eugène Nicolas.

We deeply regret to announce the death of Colonel Eugène Nicolas, retired list of the French Army Veterinary Service and an Honorary Associate of the Royal College of Veterinary Surgeons (10th October, 1919). Born on the 2nd June, 1867, he graduated at the Alfort Veterinary College in 1890, and he also obtained the degree of Doctor of the Faculty of Medicine at Bordeaux. His whole life was spent in the scientific advancement of his profession and his activities were continued up to the end; indeed, his recent contributions to scientific veterinary literature showed no indication of approaching death. His best-known work was on Veterinary Ophthalmology, the second edition of his book on that subject having been published only a few months ago. During the Great War he was Principal Veterinary Officer of the 13th Corps of the French Army, with the rank of major, and was one of the representatives of the French Army Veterinary Service appointed by the French Ministry of War to confer at Abbeville with representatives of the British Army Veterinary Services serving in France relative to matters of professional interest appertaining to animals of the respective Forces. His remarks on epizootic lymphangitis, periodic ophthalmia, and mange on that occasion were much appreciated by the joint conference. Veterinary science is the poorer for his loss at so early an age.

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Death of Mr. A. B. Charlton.

It is only a fortnight ago that our columns contained a well-deserved tribute to Mr. A. B. Charlton in connection with the publication of his official record of the history and progress of the Shire Horse Society. It is now our painful duty to record that the attack of influenza from which our contributor noted him to be suffering on the occasion of the recently-held show of the Society, has terminated fatally. Mr. Charlton was well-known in person to a very large number of veterinary surgeons who can, from their own knowledge of him, endorse every appreciative word of the following, penned by Sir Walter Gilbey in *The Times* of Tuesday last:—

"The sudden death of Mr. A. B. Charlton, secretary of the Shire Horse Society, Hunters' Improvement Society, and hon. secretary of the National Horse Association, will cause widespread grief to the world of horse lovers and many agriculturists. My close association with him for over 40 years impels me to write a brief appreciation of such an old friend.

"Mr. Charlton was a remarkable man, possessing a distinct personality in the discharge of his great activities. He displayed an unusual capacity for vigorous work and was a master of detail, and he had a creative faculty and initiative seldom to be found. His first and last thought in life was devoted to the welfare and progress of the societies to which he was so much attached, and to these attributes their great success, and the usefulness they have achieved, are to a great extent due. He ever had the interests of his staff at heart, and this fact, combined with his great abilities, made him, as indeed he was, a brilliant secretary. He was a man whose death all associated with him in the breeding and study of horses deeply deplore, and none more than I."

The late Mr. Charlton's long connection with light horse breeding is dealt with in the following communication which we have received from Mr. F. H. Badge, Assistant Secretary of the Hunters' Improvement and National Light Horse Breeding Society:—

"The news of the death of Mr. A. B. Charlton, after so long a connection with the Hunters' Improvement and kindred societies, will be received with sincere regret by all interested in Light Horse Breeding, and by all those with whom his work brought him into constant touch. His whole energy and interest was concentrated on the realisation of the objects of the Breed Societies, and in the furtherance of their welfare.

"Elected as Secretary of the Hunters' Improvement Society in August, 1887, Mr. Charlton held the position for 42 years. He edited all the Hunter Stud Books and it was a matter of sincere regret to him that illness prevented his organisation of the Hunter and Thoroughbred Show recently held in March last, after having run every show from the commencement.

"In 1898 the National Pony Society moved to 12 Hanover Square, and another Society, with its sequence of Spring Shows and Stud Books, came under the guiding hand of Mr. Charlton until 1912. In 1899 he was invited to take in hand the destinies of the County Polo Association and until the war was running four large Annual Polo Tournaments, with a successful week for County Players at Ranelagh.

"The activities of Mr. A. B. Charlton were not yet exhausted, as upon the constitution of the Advisory Council of Horse Breeding in 1911, he was selected to be one of the Joint Secretaries. Further, he was Hon. Treasurer and a member of the Committee of the London Cart Horse Parade, and since 1922 Advisory secretary of the newly-formed National Horse Association."

Royal Veterinary College Rebuilding Fund.

Mr. Herbert Buckingham's Fine Effort.

A magnificent example to other veterinarians who, having graduated at London, desire that their old College should be worthily housed and endowed, has been set by Mr. Herbert Buckingham, of Norwich, whose efforts are the subject of the following notes in the *Eastern Evening News* of April 23rd:—

"Many readers know of Mr. Herbert Buckingham's enthusiastic work on behalf of the rebuilding fund of the Royal Veterinary College at Camden Town. He had just achieved his ambition of collecting a total of £250 for this object when I met him yesterday. It was also Mr. Buckingham's 66th anniversary of his birthday, so there was cause for double congratulation.

"The college for which he has been collecting with such success felt the effect of the war period as much as any of our national institutions. Although the £250,000 aimed at for the fund has not yet materialised, there has been a good response to the appeal throughout the country.

"The promise of the Government to double any amount subscribed up to £35,000 means that Mr. Buckingham's collection ensures the substantial contribution of £500 to the rebuilding fund. The personal letters he has written to accomplish this run into over a thousand in number. He tells me he is still open to receive further contributions."

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Our President and the General Election.

To the Editor of the Veterinary Record.

Sir,—Although members of the veterinary profession belong to different political parties, we all realise the importance of having a member of our profession in Parliament, whether he be Conservative, Liberal or Labour.

For years we have been dreaming of the future, but these dreams will never come true if we are content only to dream them. We have been living in our own little sphere, doing excellent work, chiefly from the scientific point of view, but neglecting those big and practical national issues on which the prosperity of every member of the veterinary profession (particularly the practitioner's) depends.

In our President we have one of the most able men this profession has produced and one who has the welfare of the veterinary profession always at heart. He has entered the busy field of politics in spite of his many other calls, and with his eloquence and expert knowledge of agriculture and veterinary matters, he should prove himself to be a great help to the country, since such services are so badly needed. The services of the veterinary profession to Great Britain are often under-estimated, but this country cannot afford to do without them. When we bestow the honour of Presidency on one of our members he deserves all the help we can give him in all his undertakings. The task before him is a great one. There are many ways in which the members of the profession can help in a matter of this kind. Voters could be influenced in divers ways, but there is one simple but practical way of rendering very material assistance, as all who are acquainted with present-day elections know. The question of an adequate supply of motor cars on the day of the election is one of the highest importance and it would be asking little of most of the members of the profession to send a car on the Election Day. The constituency which our President is fighting is an extremely large one and an enormous number of cars will be required. Will any willing to send their cars, send their names to one of us or direct to the Liberal Agent, Liberal Club, Oswestry—and please state whether accommodation will be required for the preceding night for the driver and car.—We are, yours faithfully,

C. Wentworth Elam, 8 Roscommon St., Liverpool.
W. K. Townson, 30 Lincoln Road, Peterborough.
April 26th, 1929.

A Veterinary Historical Museum.

To the Editor of the Veterinary Record.

Sir,—May I be permitted to express my appreciation of Dr. Bullock's research into veterinary history, one example of which you published in your issue of April 27th (p. 339). With the rapid progress of our science the study of veterinary history becomes imperative, since the estimate of this progress, of which we are proud, is frequently falsified through ignorance of the past. Dr. Bullock spoke for all of us when he paid his tribute to the great pioneer work of Sir Frederick Smith, in hewing a path through the vast jungle of ignorance.

Some time ago Sir Frederick Smith inspired one possessed of a collector's mania with the idea of establishing a veterinary historical museum, and about eighteen months ago, with the consent of the Principal, a nucleus of a collection was set out in the Museum of Pathology of the Royal Veterinary College. Towards this nucleus Sir Frederick Smith, Dr. Bullock, our colleagues on the staff of the R.V.C. and other friends have given objects and valuable advice. The beginning made and the future prepared for, we regard Dr. Bullock's reminder of our heritage from the past as particularly appropriate for making known our aspirations.

We hope to form a collection which will illustrate the evolution of veterinary science, and preserve the relics of veterinary surgeons who have conferred distinction upon their profession. We feel that such a collection, through which we can see the reality of the men to whom the objects belonged, will be a just tribute to our predecessors' work and a stimulus to further research by oncoming generations.

A brief description of desirable objects of historical interest may best express the scope of such a collection. *e.g.*, (1) Paintings, miniatures, prints, busts, carvings, glass, pottery and medallions illustrating veterinary history. (2) Surgical instruments and appliances peculiar to veterinary surgery, apparatus for restraint, etc. (3) 18th century (or earlier) pharmacy jars, bottles, mortars, drenching horns, "physicks," etc. (4) 18th century (or earlier) signboards. (5) Archæological remains of domes-

ticated animals. (6) Charms, totems, and other objects used by primitive peoples against diseases of animals. (7) Military relics of especial interest to the R.A.V.C. (8) Early printed books, manuscripts, autograph letters, etc.

Many objects worthy of preservation and display not covered by this outline will occur to your readers, and we hope that whenever the spring-cleaning of surgeries, lumber rooms, desks and drawers occurs, they will remember that the museum may be more suitable than the dustbin for the receipt of their "old things."

Finally, Sir, in spite of limitations of time, money, space and other desirable resources, which impel us to go slowly, we shall do our best to justify the advice of friends who regard the Royal Veterinary College at the heart of the Empire as the most fitting repository of a Veterinary Historical Museum.—I am, Sir, yours, etc., TOM HARE.

Department of Pathology,
Royal Veterinary College, London, N.W.1.
30th April, 1929.

(1) Milk Fever; (2) Veterinary Posology.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I always turn with interest to the correspondence columns in the Press. To my mind, they are fresher, more alive, and less hackneyed than many of the ponderous and authoritative pronouncements on burgeois and commonplace subjects. Your correspondence column has been quite interesting lately; it has shown a refreshing turn of constructive criticism.

Mr. Watson asks for a helping hand with *post-partum* paralysis. I have had some good results by a blister applied to the loins and at the same time some rubbed on the points of the hocks, and hypodermic injections of oil of camphor or caffeine. Some men believe in the application of a hot smoothing iron along the back. A good loose box, bedded with straw or hay seeds, is a great advantage. Inflation of the udder may also be tried.

Veterinary Posology.—The experiences of practitioners of years with remedies need collecting, dissecting and classifying, and to them need to be added the brilliant and successful results obtained by some of the younger men with experimental medicine. I have always thought that the knowledge and application of hypodermic medication as regards animals is in a very primitive state. The whole field needs exploring and cultivating and bringing up-to-date. There is no authoritative or trustworthy book on the subject.

The food and dietetic lists need widening and investigating. Do we know as much about invalid diet, and strengthening and supporting fare in the case of animals, as the members of the medical profession do in the case of the human being? Yours truly, G. MAYALL.

Bolton.

(1) Proprietary Medicines; (2) "Orthodox Treatment."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I must hasten to inform Mr. Tutt that in my last letter I was making no veiled reference to his use of "Fructole Bromide," of which I know nothing. I certainly do not like the sound of its name. With regard to my criticism of the too abundant use of proprietary articles I find I have a supporter in Dr. Clough who, in the last paragraph of his note, hit the nail on the head, whereas I only hit my thumb.

There is one matter which I think requires attention at our hands relating to the treatment of disease and that is the present lack of information concerning what may be called "orthodox treatment." For instance, what is accepted as the correct management of pneumonia in the dog? Oxygen, counter irritants, drugs of all kinds, biological products, hygienic measures, *vis medicatrix naturæ*, and many other measures are employed more or less indiscriminately. I should like to know what is usually recognised as being the most successful.

Yours truly, BERNARD GORTON.

22 Arnewood Road, Bournemouth, Hants.
29th April, 1929.

"Milk Fever and the Nervous Forms of Distemper and Hysteria in Dogs."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—"Fe, Fi, Fo, Fum—I smell the blood of an Englishman!"

May I take this opportunity of thanking Dr. Gordon Ward for his valuable criticisms and the commendations of my few poor remarks anent the so-called encephalitis lethargica in dogs.

As he justly remarks, the term "sleepy sickness" is purely colloquial if not parochial, and it was no doubt coined to satisfy the label-loving urge of the unscientific public. If this is so, why should professional men still use such a term? It is to be hoped that in the veterinary profession we have not men who are biassed by such petty and mundane motives when they report observations. The label "sleepy sickness" can surely only be a convenience when it is applied to the somnolent type of a nervous disorder. Dr. Gordon Ward would not like to make "confusion worse confounded" by applying it to a disease in which insomnia is a characteristic.

Local topography is often confounded by the aid of a "Claymore," and I have no doubt that under its influence the epidemiology of the district might become confused.

Mr. Pugh and Dr. Gordon Ward remind me of Tennyson when he wrote:—

"Ye think the rustic cackle of your bourg,
The murmur of the World."

Again, with the immortal Robert we might say:—

"Rusticity's ungainly form,
May cloud the highest mind."

I have never had any doubt but that Mr. Pugh's animals suffered from an encephalitis. Interpretation of that encephalitis is where we differ. An encephalitic form has been an aspect or sequel of distemper since time immemorial. It may be said, with Sir Philip Sidney, that we are "Like them who have the jaundice, to whom everything appeareth yellow."

Mr. Spicer and Mr. Pugh are freely entitled to call a condition what they please. There is no reason why other observers should follow in their trail. This view seems to me to be perfectly rational according to the teachings of any subject.

Milton said, "Opinion in good men is but knowledge in the making."

I, with Dr. Ward, would plead with scientists, at any rate veterinary scientists, to leave names alone for a time. Assemble facts, criticise and criticise until the truth is known, and then abide by it.

"Posterity pays every man his honour."

I would ask them to remember:—

Firstly, King Charles' advice to Lord Wentworth, "Never make a defence before you are accused" and, secondly, the advice of the mother fish to her son when he announced that he could see a beautiful worm suspended on a hook, "Don't jump to conclusions."

Yours, etc., J. MCCUNN.

Royal Veterinary College, London.

(1) Three-teated Cows; (2) Normal Saline Solution for Dogs.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—About two years ago I saw a natural three-teated cow. The animal was of the Ayrshire breed and had been bought with her defect, so that nothing was known of her antecedents. The left half of the udder was normal, but the right half appeared as a single unit, with no sign of a division and with only one teat. When the cow was viewed from the side, the single teat appeared to hang midway between the other two. The cow was not in heavy milk at the time, but out of curiosity I asked to have her milked while I was there. Each of the normal left side teats gave one pint of milk, and the single right side teat gave one quart.

Normal Saline Solution for Dogs.—The use of normal saline solution subcutaneously with potassium bromide by the mouth for nervous conditions of the dog, as suggested by Mr. Spicer, is most interesting. I have not yet

tried the drugs in combination, but during the past few years I have often given normal saline solution subcutaneously to dogs, and my object in writing is to point out that it can be given with perfect safety in much larger quantities than Mr. Spicer recommends. My use of it has chiefly been in cases of distemper, and while I admit that there have been many disappointments, on the whole I think the treatment is rational and fairly successful. However, it is not to advocate its use in any particular condition that I write, but merely to show that it can be given in large quantities. As a general thing, I should give, to a medium-sized dog, not less than a pint, warmed, and injected subcutaneously high up on the side of the chest. The sides, of course, bulge out with the liquid, but in a few hours absorption is complete.

Let me give two illustrations of the freedom with which normal saline solution can be used. Not long ago a local medical practitioner called me to attend one of his dogs, a Scottish terrier, affected with distemper, and he asked me to try this treatment on it. On the first day I injected a pint, next day a quart, and on the third day a pint again. There was a little uneasiness and whining after the large injection on the second day, but it soon passed off. No other treatment was given, and the dog made a very quick recovery. The other case to which I wish to refer occurred a little over a year ago in a mongrel dog, a little larger than a Fox terrier. This dog took a recurrence of distemper in a very severe form, but without nervous symptoms, five months after the original onset. I took him to my own kennels, and for three weeks he received twice a day and, occasionally, three times a day, one pint of normal saline solution. The case was a particularly severe one with, for a time, complete loss of appetite, with persistent diarrhœa and extreme emaciation, but complete recovery took place. I am, yours faithfully, DONALD CAMPBELL.

35 Calderwood Road, Rutherglen.

25th April, 1929.

The Crucial Incision Operation.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—For the information of those performing the "crucial incision operation" for the relief of the sphincter of the cow's teat, I wish to state that it is usually necessary to continue the incisions until the flow of milk, when drawn in the usual way of milking, is a little easier to draw than that from the opposite teat. A similar stream (quantity) to that from the other teat is not always an indication that the incisions have been carried far enough. By pressure it is frequently possible to obtain as big a stream of milk with more pressure by the hand, although the orifice is smaller. This can be misleading.

The best way to ensure the correct depth of incision is to draw the milk from both quarters, without looking at the flow of milk—when both quarters are milked with the same amount of ease then success will be ensured. If this is not carried out it may be found necessary to make further use of the instrument at a later date.

By following the above rule the sphincter is rested immediately, which is one of the important principles of surgery achieved by the operation.

May I, in a few words, be allowed to congratulate Mr. Harvey and the writers of the recent article on tetany for their observations and work on that disease in the equine; at the same time, to put on record that it is met with in Westmorland, mostly in "Fell ponies," with foal at foot. Before recognising the condition as tetany and adopting Mr. Harvey's treatment I have on occasions seen most marvellous recoveries from the acute condition without treatment which could have been beneficial. I am sure there are a great many practitioners who will have reason to thank the four gentlemen who have done this good work.

In conclusion, may I very earnestly and respectfully ask practitioners, especially the senior members of the profession, to send for publication in the *Record* any useful information on theory or practice which may not be generally known. Yours faithfully, OSCAR STINSON.

Appleby,

22nd April, 1929.

Tetany in Welsh Ponies.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—The recent article by Messrs. Montgomerie, Savage and Dodds on the above subject interests me greatly, because in the Summer of 1897 I met with a series of cases, five in all, at Mold, North Wales, and have never seen the disease since. This condition is described by the late Professor W. Williams, Edinburgh, who in early manhood practised at Mold, under the title of "*Pseudo-Tetanus*," but whether he saw it in that district does not transpire. At the time these cases were seen, a considerable number of mountain ponies, for use in the various collieries of the district, were brought from Anglesea, Carnarvonshire and Denbighshire, and in those days they were always travelled by road.

My first case was in a four-year-old mare pony, one of a batch of six, which had travelled from Carnarvon fair, taking over two days on the journey, in hot weather. When a few miles from Mold, this pony was found to be very stiff, and soon became so distressed that she was taken to a wretched cottage stable and I was sent for. I found her down, sweating profusely, and apparently exhibiting all the symptoms of acute tetanus, including partial protrusion of the *membrana nictitans*. I would here remark that when an animal is lying down in pain and distress from any cause, with head and neck extended to the full, there is apt to be some mechanical obtrusion of the membrane, even though there be no tetany. I have seen this happen in acute colic, and it was so here, but have no doubt that had the animal been got on its feet the symptom would not have been observable.

I was a very young practitioner, and although there was in my mind an uneasy feeling of something unusual, and atypical in the case and its history, yet the clinical picture was so vividly like true tetanus, that I failed to distinguish it, and gave a dose of chloral, and a very pessimistic prognosis. Next morning, however, I diagnosed it on sight, for the pony was on its feet, perfectly normal, munching grass, and I departed feeling that the drover didn't think much of me. A month later I saw two mare ponies of a big drove which had come by road from Abergele, in exceedingly hot weather. In these, the symptoms, although exactly similar, were not so acute, and the animals being on their feet, no protrusion of the *membrana nictitans* could be induced, and both were practically normal next day, with no real treatment beyond rest and quietude.

Another typical case occurred a few weeks later and recovered, but the last of the series was very acute in a stallion pony, and died some few hours after being seen, being the last with which I ever met.

These animals all came from Anglesea, Carnarvonshire or Denbighshire, and all had travelled long distances with little food in very hot weather, and my conclusion at the time was that muscle fatigue, with a surcharge of metabolic products in the system, might be factors responsible for the symptoms.

Yours faithfully, EDWARD P. EDWARDS.

Mold.

Country Practice and the Veterinary Profession.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—It seems an extraordinary state of affairs that veterinary surgeons now-a-days do not appear to be willing to do the work of a general country practice. I have advertised an old-established, sound, country practice—actual receipts £600 a year or more, rent and expenses very low, price almost a gift, as ill-health is sole reason for retiring—and not one veterinary surgeon has troubled to come to see the place, because it is in the country.

Is country practice in the future to be left to the "quack"? If so, it seems to me to be a disgrace to the veterinary profession. Yours faithfully, C. H. DELACHERIOS.

Crossways House, Sandford, near Bristol.

The Editor acknowledges the receipt of the following:—Communications from Mr. R. E. Glover (Cambridge) and Dr. F. C. Minett (London).